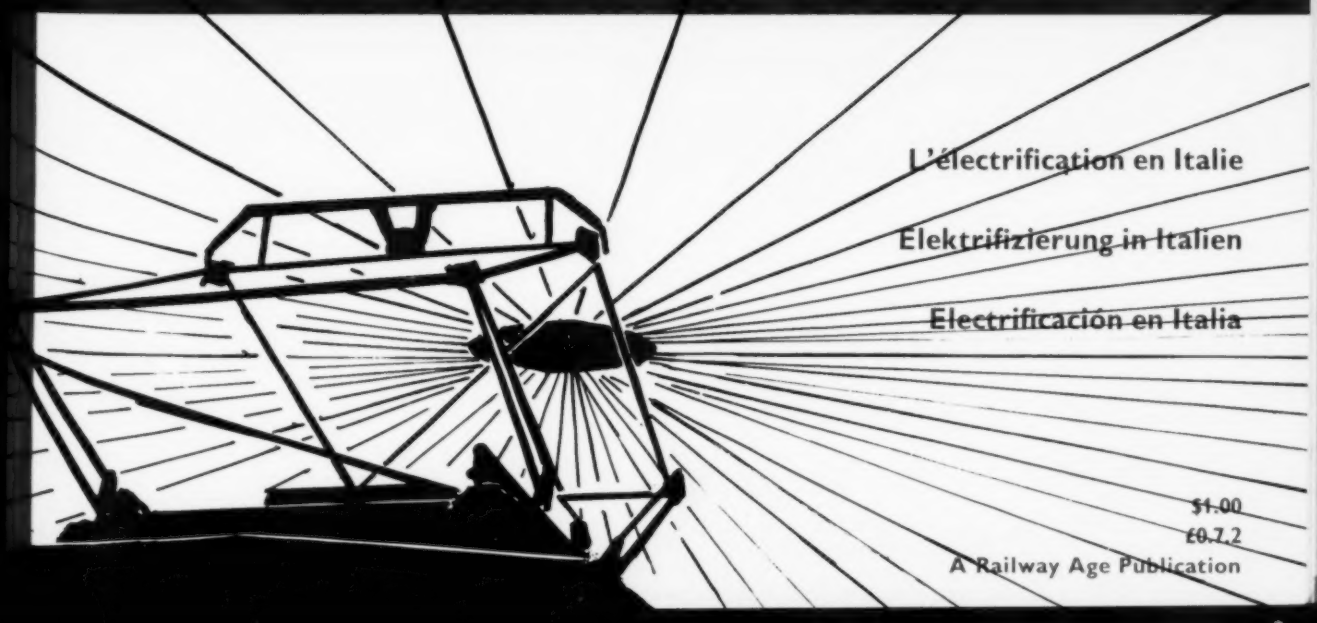
Britain's Modernization Plan

Le Plan de Modernisation Britannique
Britischer Modernisierungsplan
Plan de Modernización en Gran Bretaña

INTERNATIONAL Railway Journal

June 1961

Electrification In Italy



L'électrification en Italie

Elektrifizierung in Italien

Electrificación en Italia

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A Railway Age Publication

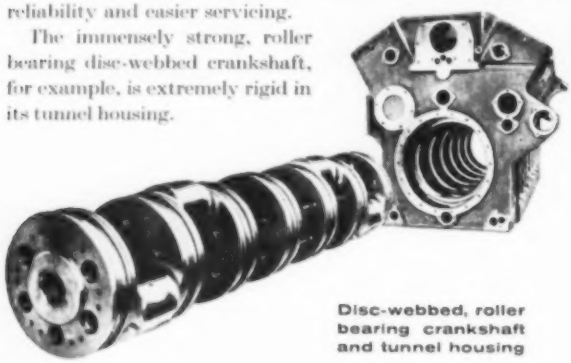
Maybach diesels power the new Hymek locomotives

Bristol Siddeley Maybach* diesel engines have been chosen for the new Hymek diesel-hydraulic locomotives. 95 of these Type 3 locomotives have been ordered for main-line use on British Railways Western Region. This now brings the total order placed with Bristol Siddeley for British Railways to 286.

DESIGNED FOR ECONOMIC OPERATION

Bristol Siddeley Maybach rail traction diesel engines range from 384 to 2,000 hp and embody design features which produce more efficient operation in terms of lower wear, greater reliability and easier servicing.

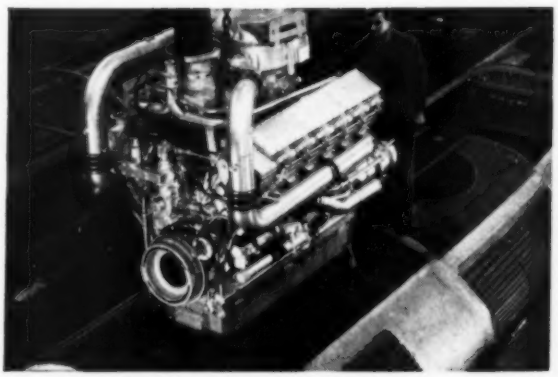
The immensely strong, roller bearing disc-webbed crankshaft, for example, is extremely rigid in its tunnel housing.



Disc-webbed, roller bearing crankshaft and tunnel housing

This results in very low main and big-end bearing wear. The pressure-oil cooling of the pistons gives effective heat dissipation which reduces liner and gas ring wear to a minimum.

Since the majority of components are identical in all models, spares stocks can be cut and servicing is simplified through interchangeability.



Maybach diesel engine being installed in D800 Class at Swindon.

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Maybach engines are in service all over the world, and have built for themselves an unsurpassed reputation as the most efficient diesel engines of today. This reputation, backed by the efficient Bristol Siddeley after-sales and spares service, offers the most satisfactory solution to all rail traction requirements.

For further information, please write to: Power Sales Manager, Power Division, Bristol Siddeley Engines Limited. PO Box 17, Coventry, England. Cables: Brisidair, Coventry.

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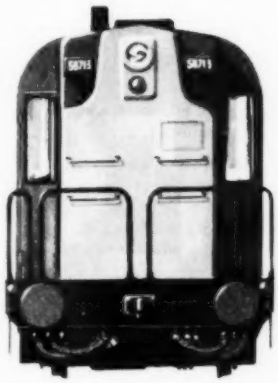
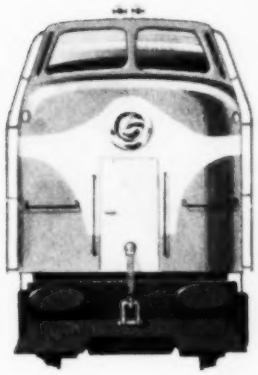
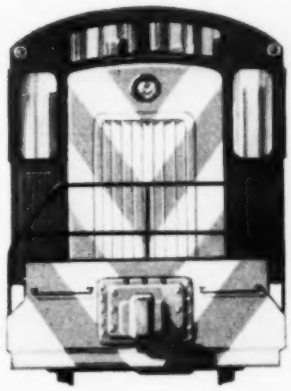
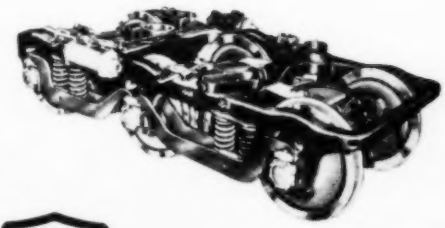






all ride on COMMONWEALTH BOGIES



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16 litre: rated power in locomotive 283 b.h.p. at 1800 r.p.m.; maximum torque in locomotive 920 lb. ft. at 1300 r.p.m.

Performance 12 litre: tractive effort 22,600 lb. at starting. Haulage capacity at draw bar at 10 m.p.h., 378 tons on the level, 133 tons on a 1 in 30 grade at 3 m.p.h.
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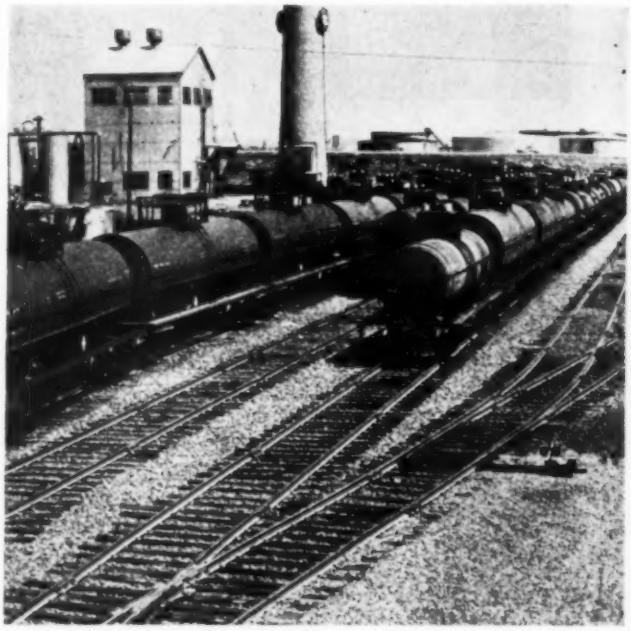

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WORLD REPORT

New International Rail-Air-Rail Service Launched in Europe

A new international rail-air-rail service has been launched in Europe by British Railways (Eastern Region), the Belgian National Railways and Channel Air Bridge. The service links London with Brussels and other Belgian cities.

Depending on the success of the new operation it is understood that Channel Air Bridge may organize further rail-air-rail services in Germany and France.

During the summer, travelers will have a choice of up to 10 flights in each direction. The average overall time between London and Brussels is five hours—some three hours quicker than the rail-sea-rail route and only about 90 minutes longer than the scheduled London-Brussels air services.

The new service also offers a cost advantage over the London-Brussels air service and the fare is not much more expensive than the minimum surface transport fare.

Passengers travel by the normal scheduled services of Eastern Region, British Railways, between London and Rochford where they transfer to bus for the journey to Southend Airport. After the flight to Ostend there is a further transfer by bus to the railway station where normal SNCB services are used to Brussels or other destinations in Belgium.

Spanish Transfesa Company Handles More European Freight Transport

Transfesa cars have been responsible for a 50 per cent increase in the tonnage of fruit and vegetables transported from Spain to other European countries since 1958. The cars, introduced in 1951, are fitted with interchangeable axles to overcome gauge differences between Spain and the rest of Europe. The avoidance of transhipment, improved refrigeration techniques, rising living standards and the liberalization of exchange controls have all contributed to the growth of Transfesa traffic between 1951 and 1957. In the latter year, the company had sufficient confidence in the further expansion of their business to order 1000 new cars. These all conformed to the British loading gauge so that they could operate in Britain, via the freight train ferry services.

Biggest percentage increases have been in traffic to Czechoslovakia (678 per cent), Holland (594 per cent), Scandinavia (293 per cent), Italy (105 per cent), Belgium (78 per cent) and England (61 per cent). Germany, the principle destination country, showed a 39 per cent increase. The only decrease in traffic was to France, although this was again improving in 1960.

The three principle commodities exported are citrus fruits, grapes and tomatoes. Car loads have also been increasing—a factor of economic interest to exporters, importers, railway administrations and Transfesa alike. The company is anxious to obtain the maximum load per car and this is encouraged by gearing freight rates to maximum loading.

In spite of the increase in traffic, Transfesa is confident that further expansion is possible. The present rate policy adopted by the railway systems and the company should encourage existing users and attract new ones.

•

PAKISTAN: Freight volume on the Pakistan Western Railway has increased at the average rate of 5 per cent per year during the past four years. More rapid increases are anticipated between now and 1965. Contributing to this improvement will be traffic resulting from construction of the Indus Basin project. These movements alone are expected to total 2,000,000 tons annually by 1962.

. . . The Railway Board in Pakistan has announced a 30 per cent rebate for individual tourists in connection with "Visit Pakistan Year." Rebates of 50 per cent are available to special groups.

COLOMBIA: The government of Colombia and International Bank for Reconstruction and Development have entered into a contract with the New York engineering firm of Parsons, Brinkerhoff, Quade & Douglas—to conduct a comprehensive survey of all transportation in Columbia.

INDIA: A delegation of the India Railway Board will visit the United States in June to study freight car construction facilities and techniques. The group is chiefly interested in freight-car design. Arrangements to visit various car-building plants are being made by the Railway Progress Institute.

CANADA: A system of federal subsidies to Canada's railways has been recommended by a Royal Commission following a two-year study. The subsidy payments would decline as various reforms, suggested by the Commission, are effected. Initially, the payments would approximate $97,000,000 (Can.), but would decline to about one-half that amount in five years. Payments for deficit passenger operations would reduce as that service is trimmed to fit present needs. Branch line services would be curtailed in recognition of motor carrier competition and subsidy payments for services now being operated would be reduced. The Commission suggested that Parliament re-examine the 1896 law under which the railways are required to haul grain from the Western Provinces at prices established when the law was passed. Meanwhile, the Commission said the railways should receive special payments to offset the losses they incur from the grain traffic.

CONTINUED ON PAGE 10

Grades, Curves, High Costs

Even where traffic is light, GRS cTc can give you the benefits of centralized traffic control at *moderate cost.*

Where your trains have to buck heavy grades and severe curves, you can eliminate unnecessary train stops. Running time will improve. The number of open offices may be reduced.

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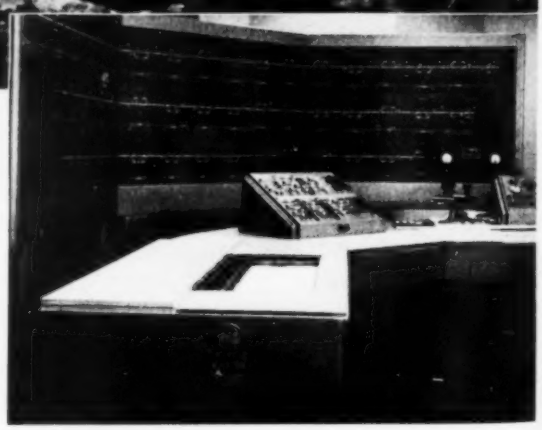

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RÉSUMÉ

Pentes, Courbes, Frais Elevés.

Même avec un trafic modéré la "CCC" GRS peut vous donner les avantages d'une commande centralisée du trafic à peu de frais.
Là où vos trains doivent remonter de fortes pentes et prendre des courbes difficiles, vous pouvez éliminer des arrêts de train superflus, raccourcir la durée du parcours et réduire le nombre d'arrêts occupés.
Selon les exigences de votre trafic, vous pouvez avoir un aiguillage électrique à un bout de chaque voie d'évitement et un aiguillage flexible à l'autre bout. Ou bien des signaux commandés à un bout et des aiguilles manoeuvrées à pied-d'oeuvre aux deux bouts. Que vous choisissiez l'un ou l'autre système, vous diminuerez vos frais d'exploitation.
Traffic Master (R), la centrale de commande GRS, permet de concentrer la commande "CCC" d'un grand nombre de kilomètres de voies uniques.

RESUMEE

Gefälle, Kurven, Hohe Kosten.

Selbst wo nur leichter Verkehr ist, kann GRS "Zü" Ihnen die Vorteile der Fernsteuerung zu einem niedrigen Kostenpreis sichern.
Wo Ihre Züge steile Gefälle und scharfe Kurven überwinden müssen, können Sie unnötige Fahrtunterbrechungen fortschaffen. Die Fahrzeit wird dadurch abgekürzt. Die Zahl der besetzten Haltepunkte kann verringert werden.
Je nach Ihren Verkehrsanforderungen können Sie eine elektrische Weiche an einem Ende eines jeden Ausweichgleises und eine federnde Weiche am andern Ende haben. Oder gesteuerte Signale an einem Ende und Handweichen an beiden Enden. In beiden Fällen werden Sie Ihre Betriebsunkosten herabsetzen.
Traffic Master (R), die GRS Steuerungszentrale, ermöglicht es die Fernsteuerung einer beträchtlichen Kilometerzahl eingleisiger Strecken zusammenzufassen.

RESUMEN

Pendientes, curvas y costos altos.

Aún cuando el tráfico sea ligero, el cTc de la GRS le brinda los beneficios del control centralizado de tráfico a un precio moderado.
En los casos en que los trenes tengan que lidiar con pendientes severas y curvas difíciles, se pueden eliminar paradas innecesarias, mejorar el tiempo consumido en los recorridos u reducir el número de oficinas abiertas. Según convenga mejor, de acuerdo con el tráfico en su ferrocarril, se puede tener un cambio de potencia en un extremo de cada desviadero y una aguja de resorte en el otro; o señales controladas a un lado y agujas de mano en ambos extremos. De un modo o de otro, el resultado es costos más bajos de operación.
El Traffic Master (R), centro de control de la GRS, hace posible la concentración de los mandos para millas y millas de vía sencilla con cTc.

TOOLS FOR TRANSPORTATION GRS

World Market

▶ *India*—The Ministry of Railways is receiving bids this month for signaling equipment, including block instruments, cables, lever locks, circuit controllers, point machines, detectors, relays, repeaters, route indicators, color light and shunt signals, signal machines and other related equipment. The purchase program is under the supervision of the Director, Railway Stores, Railway Bhawan, Raisina Road, New Delhi. Preference is to be given India manufacturers, with or without collaboration with foreign firms.

The first diesel locomotive incorporating the mechanical transmission invented by M. M. Suri has arrived in India for service testing. This unit, one of seven ordered by the India Railway Board, was built in West Germany by Maschinenbau Kiel.

▶ *Japanese National Railways*—Proceeds from a World Bank loan of $80,000,000 (US) will be used to finance about one-seventh of the cost of the new double-track heavy-duty rail line between Tokyo and Osaka. Known as the Tokaido Line, the 500.5-km railway is planned to provide the world's fastest rail service. It will be an electrified system, of 1.435-m gauge. Construction plans call for 80 tunnels, numerous bridges and other elevated track structures. Self-propelled railcar sets will be employed in both passenger and freight service. Passenger trains will consist of multiple-unit carsets to a maximum of 16 cars seating 1,250 persons. Freight trains will have a rated capacity of 750 tons. Total cost of building and providing equipment for the line is estimated at $548,000,000 and service is expected to begin by early 1964. Bids for major construction work and rolling stock are being obtained from foreign contractors and manufacturers as well as domestic companies.

▶ *Pakistan*—Has secured a $6,500,000 (US) loan from the Development Loan Fund for procurement in the United States of new railway equipment. Funds will be used to acquire 23 broad-gauge diesel-electric locomotives, rails, rail fittings, points, crossings, special timber, and structural materials for improving terminal facilities. The DLF has made two previous loans to Pakistan, totaling $31,100,000, for railway rehabilitation programs.

Agreements have been signed with the United Kingdom for credit of £3,000,000. Funds will be used primarily for the purchase of railway rolling stock.

▶ *Western Australian Government Railways*—Has recently opened a new freight classification yard and terminal at Leighton to serve the major Western Australian seaport at Fremantle. The work included a modern hump marshaling yard, two classification yards, a 60-lever signal tower and extensive yard remodelling.

▶ *Termicas Asturianas*—This association of three privately-owned Spanish electric utility companies has received from General Electric Company a 35-ton diesel-electric locomotive equipped with dual couplers for handling cars on tracks of either one meter or 1.674-meter gauges.

▶ *South African Railways*—The "twinning"—laying a second track on a different location from existing single track—is under consideration for lines from Durban to Darnall, and for several sections between Tugela and Empangeni.

CONTINUED ON PAGE 53

AUSTRALIA: Legislation will be introduced at a forthcoming session of the Queensland Parliament to ratify an agreement between the State and a large contracting organisation, on the construction of an £8 million 110-mile railway between the Kianga coalfield and the seaport of Gladstone. Negotiations on the broad principle of the agreement have been reached and the company will build the line to provide a direct link between its coalfield at Kianga and the nearest seaboard outlet. It is possible that the new railway may be operated on the 50 cycle electrification system.

. . . Arrangements have now been completed where rail passengers in all Australian States can arrange to have drive-yourself cars available at their destination. It is anticipated that rent-a-car facilities will develop into big business in the way of additional long distance passenger traffic and booking commissions for the Australian railway administrations.

TURKEY: Improved railways communications between Turkey and the USSR will be the result of an agreement signed at Ankara recently. An announcement of the results of a series of conferences indicates that the USSR will provide material and some construction personnel for the conversion to standard gauge of some 123 km of broad gauge track. The Russian aid will enable the Turkish State Railways (TCDD) to complete one of the last remaining major projects in the unification of Turkey's railway network.

FINLAND: Five new ore wagons are being used experimentally between Outokumpu and Kotka before the model goes into large scale production. The wagons have four axles and are equipped with two electric-hydraulic tipping troughs which can be dumped either separately or together.

UNITED ARAB REPUBLIC: The Transport Office of the UAR has complied with the request of the organization of the Chambers of Commerce in the territory of Egypt, establishing a special department for the advancement and proficiency of rail transport.

. . . At the eighth session of the Transport Committee of the Arab States it was decided: To apply to the Arab Governments to complete within ten years a railway network of their territories; to make an appeal for the establishment of a company to construct railways connecting the neighboring countries; to determine railway terms in Arab language and finally, appeal for an organization of land transport in the Middle East.

BRAZIL: The Federal Railway System has received priority attention by the new government of President Quadros. Herminio Amorim, Jr., has been appointed to head the railway, while President Quadros himself has requested the system to review its rate structure, reduce expenditures and improve services, especially on the Central do Brasil and the Leopoldina railway lines. A special committee has been formed to revise the Federal Railway's administrative structure, with the objective being greater centralization and concentration of authority.

UNITED STATES: The mobile Minuteman missile program, which contemplated the random movement of armed missile trains on the nation's rail network, has definitely been "deferred." First hint of this came in a recent message to Congress from President Kennedy.

PHILIPPINES: The Manila Railroad Company has taken steps to intensify the company's freight operations. Orders have been made for 200 flat cars, each with a capacity of 40 tons and with axle roller bearings. At the same time 10 flatcars are to be converted into livestock cars. Other plans include the construction of spur and extension tracks at sensitive points on the line. These moves to bolster the MRR's freight services have been caused by the fact that the company has to turn away millions of pesos worth of business annually, due to its limited capabilities to satisfy demands of commercial shippers.

ITALY: A preview of the FS 1960 annual report now in preparation shows that the numbers of employed personnel are up sharply from 155,340 to 164,220, in spite of some reduction in office staff. Other highlights include: electrified trackage up from 14,360 km to 15,130; electrified route-km to 7610 from 7140; electric locomotives up from 1650 to 1733 and steam down from 2123 to 1863; main-line diesels 23, shunters 120; electric railcars and trainsets up from 348 to 367; internal combustion from 977 to 1027. Total passenger cars were down by 50 to 8280; freight cars up 2600 to 125,200. Passengers carried rose from 372.8 million to 380.7 million; passenger-km from 25,650 million to 26,850 million, while freight traffic rose from 13,270 million ton-km to 15,660 million. Total revenues up from 253,590 million lira to 280,810 million.

EAST AFRICA: Despite uncertain economic trends, the financial position of the East African Railways and Harbours was maintained during 1960. Freight traffic carried by rail showed a small increase over 1959 with little change in the quantity or type of principle commodities handled. Although the number of passengers dropped slightley by 779,000 to 5,352,000 there was a slight increase in revenue – indicating that the average miles per journey had increased. The fall in numbers has been attributed to the withdrawal of several short distance services.

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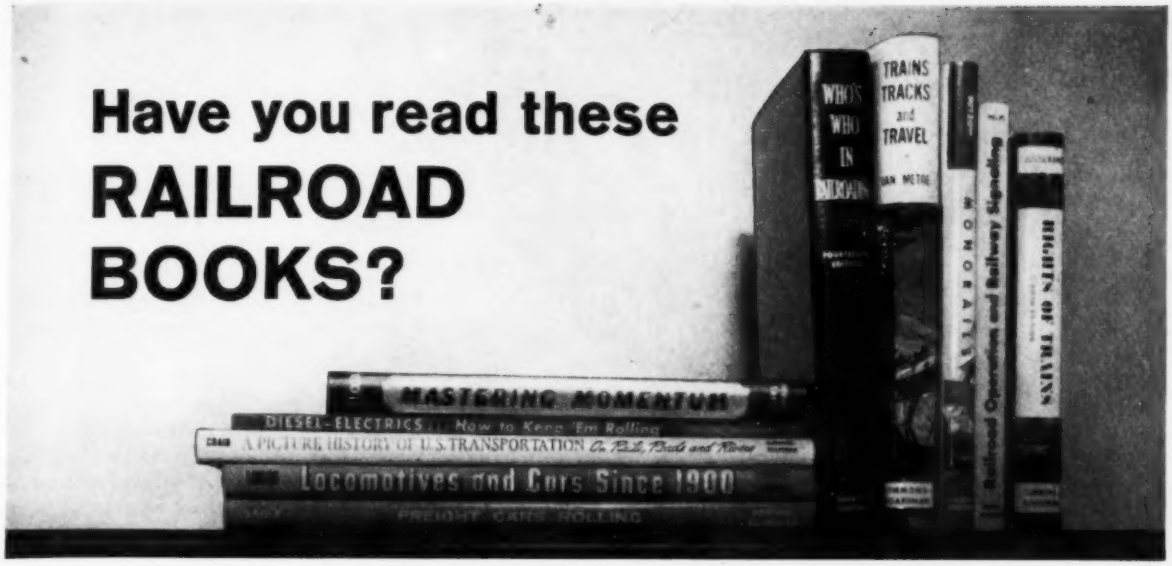
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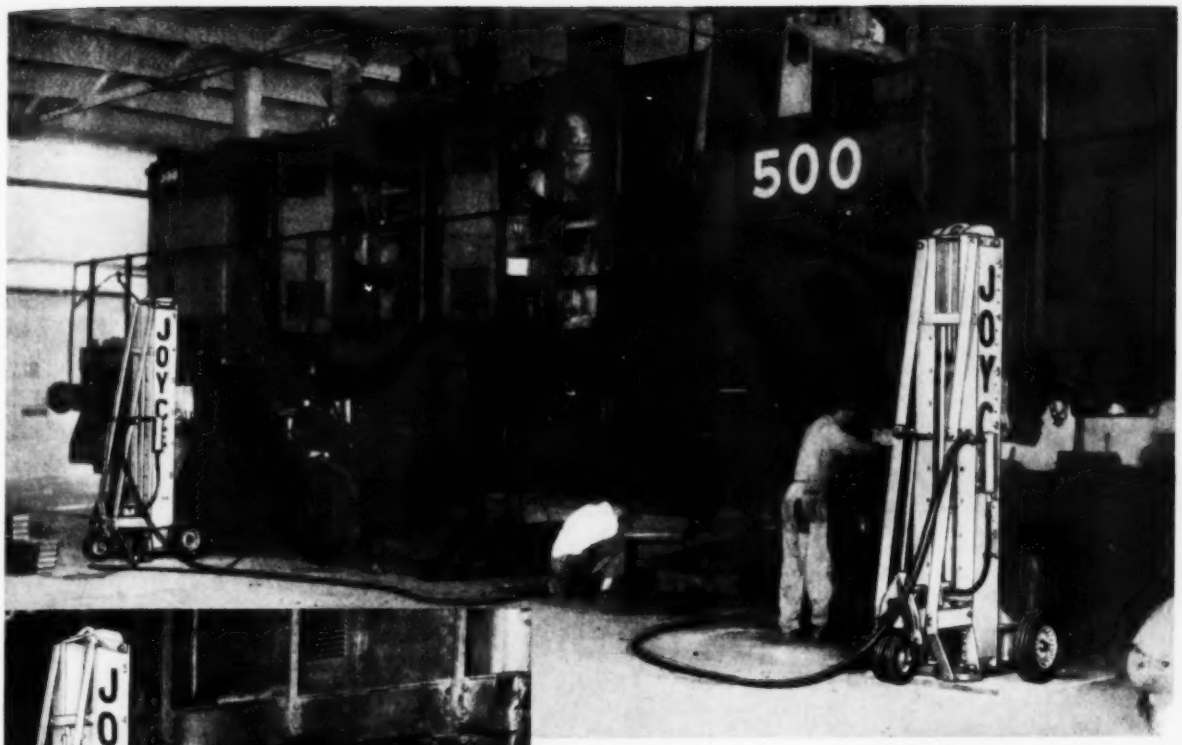

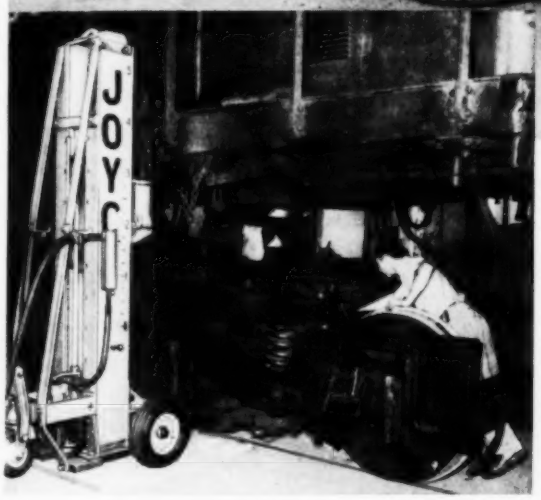

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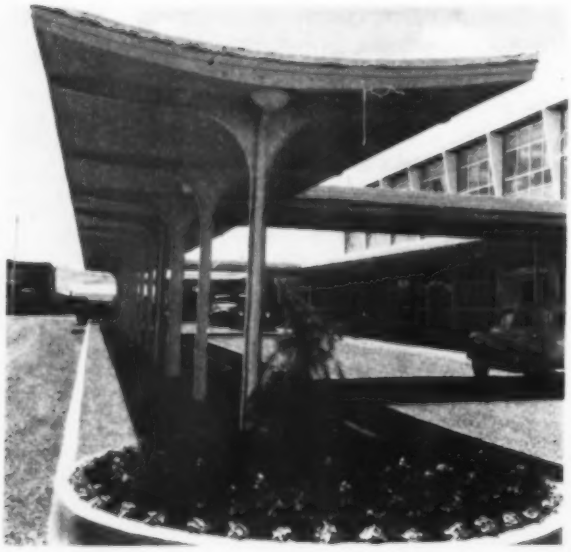
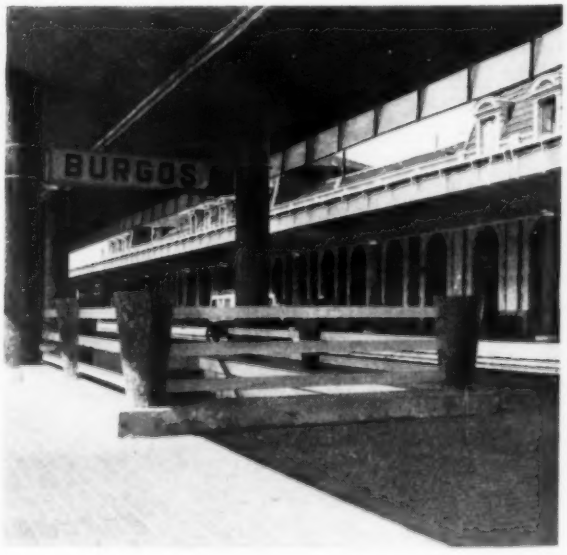
◀ FRANCE: High carrying capacity and possible operation at express train speeds are features of a new type of double-deck automobile carrier. Despite being a four-wheeled car it has an overall length of 17.4 meters, a tare weight of approximately 15 metric tons and can carry a total of 10 vehicles. Produced by the Société Nouvelle des Ateliers de Venissieux (SNAV) for the Société de Transports (STVA), the double-deck car can be used in conjunction with the car-carrier or auto-couchette passenger services or movement of vehicles between manufacturing plant and distribution centers. It is equipped with the necessary suspension and braking system to enable it to run at speeds of up to 140 km/h. To allow sufficient carrying capacity, the lower deck is arranged to take two pairs of small vehicles, side by side. A larger vehicle can be accommodated fore and aft of these pairs, providing maximum room for six automobiles. The upper deck has space for four more; one behind the other.

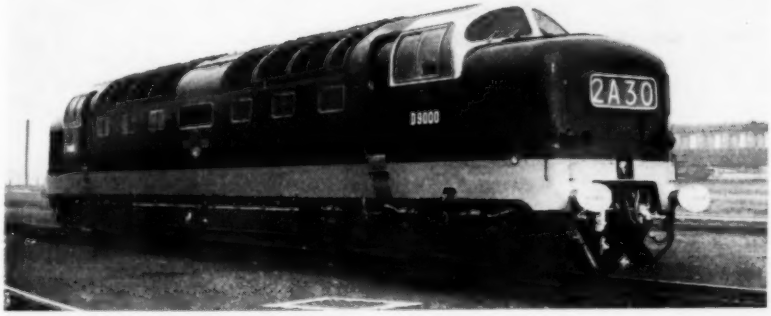
News briefs in pictures . . .



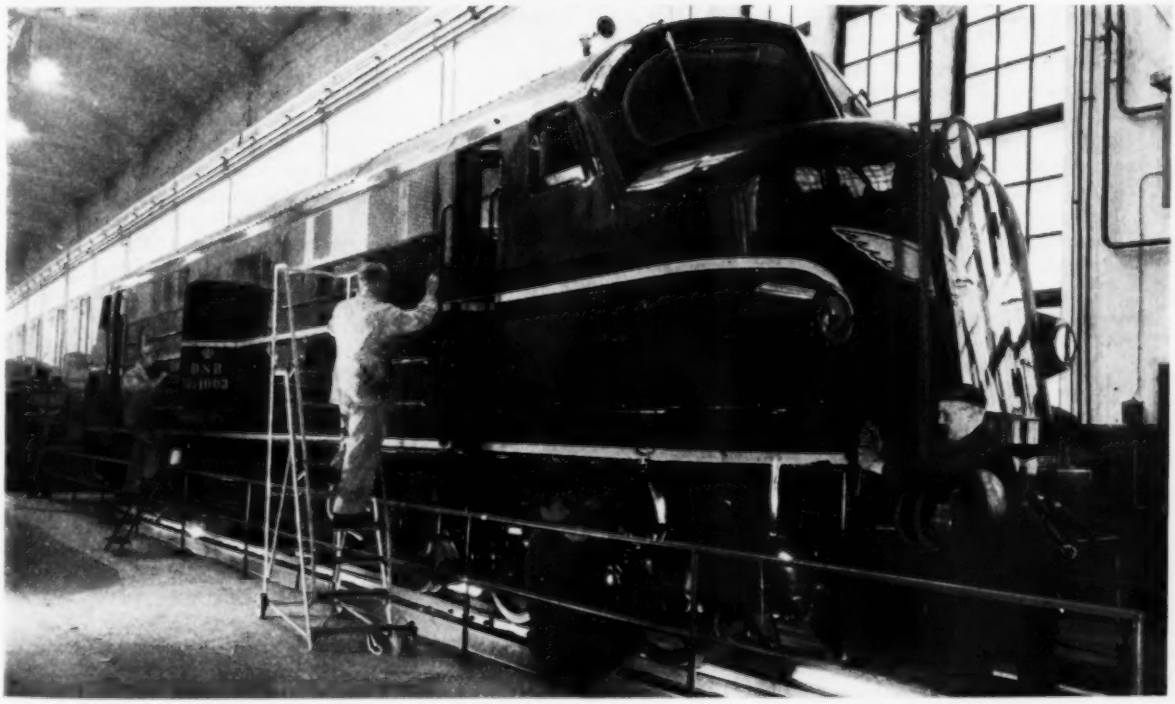
◀ NEW ZEALAND: A new rail and road travel center, the first combined terminal in New Zealand, has been opened at Rotorua, center of the country's main thermal region. Measuring 83.82 meters in length by 8.53 meters in width, the new building is compactly located between railway and road service platforms. The booking office, parcels and luggage facilities, waiting rooms and refreshment service, serve both railcar and road service passengers. The cabling of power and telephone services has enabled the forecourt to be laid out neatly, and heating for the building is supplied by steam tapped from a nearby thermal bore. The opening of the £85,000 travel center marked the second-to-last stage in a £200,000 modernization plan initiated in 1956. The plan involved, first, a modern garage and servicing facilities for road vehicles; second, a new rail and road passenger terminal; and third, a rearrangement and extension of the railway goods yard facilities.



SPAIN: Extension of facilities at the Spanish station of Burgos ▶ are now completed and all traffic requirements can be dealt with. It is hoped the new station will become a main junction on the Renfe system. The travelers' building is all that remains of the old station and even this has undergone drastic transformation. Four 300-meter-long platforms have been built, covered with roofs of reinforced concrete. The platforms are joined by two new subways designed for heavy passenger traffic, and a new public address system laid out. Several auxiliary buildings have been built, including a locomotive circular shed, bedrooms for the staff and freight platforms. Money has also been invested on tracks and installations and several signaling works. The cost of the new station has amounted to approximately 83 millions of pesetas.



◀ BRITAIN: Recent designs, shown by the British Transport Commission as part of the Golden Jubilee celebrations of the Institution of Locomotive Engineers, included type 3 BB diesel-hydraulic locomotive (above left) and the type 5 Deltic (below left). The 3 BB is the first of 95 to be built and the one illustrated has not yet been handed over to the Western Region, British Railways, by the builders, Beyer, Peacock (Hymek) Ltd. The power unit is a Bristol-Siddeley Maybach MD. 870 engine developing 1700 bhp at 1500 rpm. The transmission is the Stone-Maybach Mekydro type K.184.U. Continuous tractive effort is 74,859 kg and the maximum speed is 144 km/h. Weight is 74 tons in working order and overall length is 15.74 meters in length. Type 5 "Deltic" is one of 22 in course of construction for British Railways. It is powered by two 1650-hp Napier Deltic diesel engines and has a total weight of about 100 tons and a maximum speed of 160 km/h. Maximum tractive effort is 114,660 kg. It has a CC wheel arrangement and is 21.17 meters in length. The exhibition also included the experimental 2,700-hp gas turbine locomotive at present undergoing trials. Developed and built by the English Electric Co., it is 20.72 meters long and the weight in working order is 123 tons. The gas turbine has been specially designed for direct mechanical drive, with separate power turbine. Other powered equipment included the London Transport's new Metropolitan Line driving motor coach—one of 232 being built. The vehicle has a light alloy underframe, bogies with rubber suspension and a body of light alloy and reinforced plastic. Among other modern rolling stock on show were the latest 3,300 hp 25 kv AC electric locomotive, a 2,500 hp DC electric locomotive and five main-line diesel locomotives.



▲ SWEDEN: One of the new MX class diesel-electric locomotives under construction by Nydqvist & Holm AB for the Danish State Railways.

WORLD POLL

Railways all over the world—with perhaps rare exceptions—are facing stiff competition for freight traffic from carriers by highway, water and even air. Here, according to an International Railway Journal survey, is what the railways' customers—leading shippers of many different products—say railways must do to meet that competition:

• Make better use of their available facilities to provide faster, more reliable, and, if possible, cheaper service for freight.

• Provide more specialized equipment for handling specific commodities efficiently, economically and safely.

• Put more emphasis on advertising and selling their services.

• See that their employes are well trained; that they take an active interest in shippers' problems; and that they help shippers to solve those problems.

Les chemins de fer dans le monde entier—sauf quelques exceptions rares—subissent une concurrence acharnée pour le trafic marchandises de la part du transport par route, l'eau et même l'air. Selon l'enquête effectuée par l'IRJ, voici ce que les clients des chemins de fer—les expéditeurs principaux de différents produits—disent ce que les chemins de fer devraient faire pour faire face à cette concurrence:

• Faire meilleur usage des installations disponibles pour fournir un service de marchandises plus rapide, plus sûre et, si possible, meilleur marché.

• Prévoir un outillage plus spécialisé pour le transport efficient, économique et sans dommages, de certains articles.

• Faire plus d'efforts en matière de publicité et de vente de leurs services.

• Assurer une bonne instruction de leurs employés; qu'ils s'intéressent plus au problèmes des expéditeurs; et qu'ils aident les expéditeurs à résoudre ces problèmes.

Die Eisenbahnen in der ganzen Welt—mit vielleicht ganz wenigen Ausnahmen—haben in den Verladern per LKW, Schiff und auch Flugzeug, eine starke Konkurrenz erhalten. Hier, in Übereinstimmung mit einer International Railway Journal Übersicht, sagen Eisenbahn-Kunden—führende Verlader sehr unterschiedlicher Güter—was die Eisenbahnen tun müssen, um dieser Konkurrenz die Stirn zu bieten:

• Ihre verfügbaren Anlagen besser ausnutzen, damit die Dienstleistungen für den Güterverkehr schneller, zuverlässiger und, wenn möglich, billiger werden.

• Mehr Spezialausrüstungen für eine zweckmässige, wirtschaftliche und sichere Abfertigung spezifischer Verbrauchsgüter anschaffen.

• Grösseren Nachdruck auf das Anbieten und Verkaufen ihrer Dienstleistungen legen.

• Darauf achten, dass ihre Angestellten gut geschult sind; dass sie den Problemen der Verlader lebendiges Interesse entgegenbringen; dass sie den Verladern helfen, diese Probleme zu lösen.

En todo el mundo los ferrocarriles—salvo unas raras excepciones—tienen que hacer frente a la competencia creciente del transporte de cargo por camino, por agua y hasta por aire. Según una investigación de la International Railway Journal, los clientes de los ferrocarriles son de opinión que para hacer frente a la competencia, los ferrocarriles tienen que hacer lo siguiente:

• Aprovechar más los equipos disponibles para dar un servicio más rápido, más seguro y, si posible, más barato.

• Proporcionar equipos más especializados para el transporte de mercancías especiales.

• Más enfásis en la propaganda y la venta de sus servicios.

• Instrucción buena de sus empleados que tienen que interesarse a los problemas de los clientes y asistir en la solución de tales problemas.

●

What Shippers Think of Railroads

Railroads could make themselves more competitive with other modes of transportation if they would provide faster, cheaper and more reliable service.

That's the consensus of opinion of major freight shippers in 11 different countries who responded to an International Railway Journal poll which sought to find out how railroads are regarded by some of their most important customers.

The survey also revealed that:

• Shippers would like to see railroads provide more specialized equipment and services, cut down on loss and damage to freight, and do a better job of advertising and selling their freight services.

• Economy is the most important factor in determining which mode of transport a shipper uses, with speed second and reliability third.

• A majority of shippers consider railway employes to be well-informed, interested in shipper problems, and able and willing to help in solution of those problems. There is, however, a substantial minority of customers who find railway people poorly informed, disinterested and indifferent.

What Governs Transport Choice?

A straight arithmetical average of all replies, unweighted for volume or other factors, shows that shippers answering the poll use railways for 53.6 per cent of their total freight shipments, excluding intercontinental, trans-oceanic movements. Another 35.8 per cent of their freight goes by highway; 3.5 per cent by coastal steamship, and 6.5 per cent by inland waterway (river, canal or, in Canada and the United States, the Great Lakes). The remaining 0.6 per cent—again excluding trans-oceanic shipments—moves by air.

Another unweighted arithmetical average of all replies shows that choice of transport methods is governed 49.5 per cent by economy; 26.75 per cent by speed, and 14.25 per cent by reliability. Safety, that is, freedom from loss and damage, is the controlling factor in only 8.25 per cent of all routings. In 1.25 per cent of all cases the choice is based on such other factors as special negotiated rates; availability of special services, such as heating or refrigeration; or the railways' ability to handle large and bulky shipments.

Both the foregoing groups of percentages are subject, of course, to wide variations in individual cases. M. Foegen, manager of the shipping department of Germany's Volkswagenwerk Aktiengesellschaft (motor vehicles and spare

parts), at Wolfsburg, points out, for example, that "on principle," his company's "choice of transportation is based on the highest efficiency of all factors combined." R. M. Boyd, director of traffic and transportation of the Pittsburgh Plate Glass Company (paints and glass), USA, says its choice of transportation method "varies according to product."

What Railways Can Do

The most important thing railways can do to make themselves the first choice of more shippers for more freight is to provide faster service, according to a compilation of all poll replies.

After that, shippers would like to have, in the following order, more reliable service, that is, service which consistently conforms to established schedules; cheaper service, "if possible"; more specialized equipment, such as freight cars designed specifically for carriage of particular commodities; safer service, with less loss and damage; better advertising and selling of freight services; and more specialized services, such as pallets, containers, piggyback, etc. Greater frequency of service is mentioned as important by only one shipper, though Österreichisch-Amerikanische Magnesit Aktiengesellschaft (magnesite and magnesite products), of Radenthein, Austria, would like to have "freight service on Saturday afternoon."

Many of the individual respondents suggest other steps which railways could take to put themselves in a better competitive position. In North America, at least, there appears to be a fairly general shipper desire for "integrated" transportation. This is pointed up in three Canadian comments. F. W. Dean, general traffic manager of the Steel Company of Canada (steel and steel products), Hamilton, Ontario, says, "railways should not be confined to handling only by rail, but should afford an integrated service by rail-truck-water-air." From nearby Toronto, A. F. Downey, traffic manager of the Glidden Company (paints), calls for "more integrated services with movement on one bill of lading." Fred Ainsworth, traffic manager of Husky Oil & Refining, Ltd. (petroleum products), Calgary, Alberta, thinks railways "should seek a way to cooperate with other types of transportation to avoid duplication and provide an integrated service."

D. W. Kennard, traffic manager of Union Carbide Canada, Ltd. (chemicals), also at Toronto, suggests that "more use of incentive loadings and specialized equipment would benefit the rails." Essential agreement on this point came from the Austrian company quoted above, which calls for bigger cars and large containers to handle heavy loads.

Alvares Romi, director of Máquinas Agricolas Romi, S.A. (machine tools), Santa Bárbara d'Oeste, São Paulo, Brazil, says railways could help themselves if they would provide "efficient truck service from purveyor's warehouse to rail and from rail to buyer's warehouse."

Comments from the United States are largely directed toward what W. C. Cole, general traffic manager of Georgia-Pacific Corporation (lumber und lumber products), Portland, Oregon, describes as "better utilization of present facilities and a more progressive approach to new facilities and services." Somewhat similarly, L. F. Van Kleeck, traffic manager of the Brown Company (paper and paper products), Berlin, New Hampshire, asks "less talk and more action." Specifically, Mr. Van Kleeck thinks railways should find some means of improving services and schedules between connecting lines, and of having freight shipments spend less time in yards before, after and during road movements. Eugene Landis, director of transportation for International Minerals & Chemical Corporation (fertilizers and chemicals), Skokie, Illinois, USA, also asks for "progressive attitudes"—and for "less government interference," a problem with which railways in his country are confronted.

J. E. Wilbee, traffic manager (rates), of Canada's Abitibi Power & Paper Company, Ltd. (paper and paper products), also at Toronto, thinks railways should have more officers with authority to make rates. In much the same vein, Mr. Downey believes delays in finalizing rate negotiations are damaging to the railways' competitive position vis-à-vis other modes of transport.

"More adjustable services" is the railways' biggest need, according to Kauko Lehti, who answered the poll for the Valio Finnish Co-operative Dairies Association (dairy products), of Helsinki. Relatively, his organization uses a greater proportion of truck transport than any other poll respondent, because of its "smoothness" and the fact that "foodstuff deliveries need fast services that are adjustable to the needs of shippers." To meet those conditions, he implies, railways must make their own services not only faster but more flexible. Economy is also a factor with Mr. Lehti's organization, as it is with the Deciduous Fruit Board of Cape Town, South Africa.

About three out of four shippers give railway employes a high rating on knowledge of and interest in shippers' problems; about two out of three consider them helpful in solution of those problems. Mr. Landis notes "rapid improvement" in those directions; while Mr. Downey also notes a "significant change" in the last one or two years. "Canadian railways," he writes, "are taking on a 'new look,' with far-reaching changes taking place in market research, sales efforts and staff reorganization."

Railway men in some parts of the world seem, however, to have a long way to go before they will merit shipper approval. Sharp criticism of their ability, their interest and their willingness to work out shipper problems came from both Italy and Japan. From the latter country, for example, Junichiro Aneha, first managing director of Tokyo Fabric Industry Company, Ltd. (rubber and rubber products), Tokyo, speaks disparagingly of the "bureaucratic attitude of railway employes."

All in all, the poll drew replies from one or more major shippers in 11 different countries—Austria, Brazil, Canada, Finland, Germany, Italy, Japan, the Netherlands, Norway, South Africa and the United States. Included in the group were shippers or receivers of such diverse freight as dairy products; salt; sugar; fresh fruits and vegetables; processed foodstuffs; cotton; lumber and lumber products; paper and paper products; rubber and rubber products; steel and steel products; coal and coke; ores of various kinds; petroleum products; motor vehicles and parts; machine tools and office machinery; paints and varnishes; glass; chemicals, surgical and toilet articles, and plastics.

Electrification In Italy

While the railway world's attention has been focused on such recent developments in electrification as industrial-frequency alternating current traction and solidstate rectifiers, the Italian State Railways (FS) administration has been busily extending electrification at 3000 volts direct current to cover every important main line in the country. With 8,140 route km either electrified now or to be completed within the month—46.2 per cent of the system—the FS today has a commanding position among European railways with respect to total electrified kilometrage.

Other railway managements are adopting or extending AC traction, but the FS is engaged in converting the last of its AC trackage to DC. The reason for this apparent reversal of the trend is not hard to find. Italy was a pioneer in AC traction—the first AC line, from Lecco to Sondrio and Chiavenna, was opened in 1901. Starting before the development of either suitable single-phase motors or the perfection of high-voltage DC traction, however, the Italian railways adopted three-phase AC using double overhead contact lines.

The relatively low line voltage—at first 3400, later 3600—was regarded as necessary to prevent arcing and insulation problems with the double overhead, particularly at turnouts, while the so-called "railway frequency," 16-$^{2}/_{3}$ cycles, was adopted to permit the use of direct-drive low-speed motors. Three-phase AC was then adopted for the "linea di Giovi" between Genoa, Bussalla and Mignanego, and subsequently was adopted as standard for electrification, the dual overhead spreading over the Piedmont and into the Italian Tyrol.

Meanwhile other forms of traction were under study, and in 1927 the Rome-Sulmona line was electrified using the then-standard industrial current, 10,000 volts at 45 cycles—still with three-phase motors and overhead. No sooner, however, was this line completed than the decision was made to adopt 3000-volt DC. It was prompted largely by the perfection of high-capacity mercury-arc rectifiers for substation use, and by the advantages of the DC traction motor.

Further electrification in the south was carried out at 3000 volts, with an arbitrary dividing line between three-phase and DC laid down across the country between Pisa, Florence and Faenza.

The result was the existence of four different and incompatible systems—three-phase 3600-volt AC in the north, 3000-volt DC in the south, and isolated sections of industrial-current three-phase (Rome-Sulmona) and 650-volt DC with third-rail pickup (Italy's first main line electrification from Milan to Varese).

As electrification spread, the existence of the conflicting systems, together with the complications involved at joint terminals, presented more and more serious problems. In 1939 the decision was made to standardize and ultimately convert where necessary to the 3000-volt DC system, the third-rail line being the first to be changed.

The coming of war disrupted virtually everything about the Italian railways including the electrification program. At the close of the hostilities 5000 km (89 per cent) of the electrified lines were destroyed or damaged; 10,800 km (90 per cent) of the overhead; 4400 km of main transmission line; and 1000 locomotives (67 per cent). Attention turned to the rebuilding of the existing system. Ironically enough, one phase of the standardization program was helped by the war; the Rome-Sulmona industrial-current line was so severely damaged that during rebuilding it was re-electrified with 3000 volts.

The present electrification program had its start with the termination of the postwar reconstruction program. Electrification of all main lines, and dieselization of secondary lines, was decided on, and the first new electrification—the 187-km Messina-Palermo line, including 306 track-km—was begun in 1949. Mostly single-track, the line began electric operation in 1955. Other lines followed.

The Bologna-Venice line, 150 km of double track, was started in 1953 and completed in 1956, the electrification of its 447 track-km costing 13,000 million lira. The 230-km Milan-Padua section was electrified during the same period, the cost of electrifying its 705 track-km amounting to 22,000 million lira. The first section of the Messina-Catania electrification went into service early in 1957, and by October 1958 the entire 97-km single-track line was converted to electric operation at a total cost of 9,500 million lira. Interesting is the fact that this line was chosen for the first application of remote-control to FS electrical installations. The 172-km Mestre-Cervignano electrification was completed in 1959 at a cost of 9,500 million lira.

The year 1959 also saw electrification of the major Bari-Foggia-Pescara-Ancona main line down the Adriatic coast. Involving 885 track-km, the 444-km project cost 30,000 million lira and completed electrification of the important Milan-Bologna-Bari route. The Voghera-Piacenza section completed another link in the system, opening electric operation between Torino and the Milan-Bari artery. A final 1959 project, electrification of the Pescara-Sulmona stretch, provided a link between Rome (via the former 10,000-volt triphase line, converted after the war) and the east coast trunk line, at a cost of 2,200 million lira.

During 1960 the electrification program departed from its commitment to 3000-volt DC long enough to build 15-kv AC overhead from Luino to the Swiss border. That, however, represented no real departure, as the 15-km stretch is operated by the Swiss Federal Railways, using its own equipment. It is in effect a continuation of SBB electrification from Locarno, a project that completed essentially total electrification of the Swiss Federal network. Together with the 46-km Gallarate-Luino electrification finished in June 1959, using DC, this short section completes the electrification of all routes between Milan and Switzerland. At the same time it makes possible full utilization of Luino as a frontier station, relieving pressure on the border station of Chiasso. The cost—310 million lira for electrification, signaling and communications and 358 million for modification of bridges, tunnels and station platforms—was financed by a loan from the SBB.

The 82-km single-track Foligno-Terontola line connects electrified routes from Rome to Ancona and Rome to Florence. It links the important tourist centers of Perugia and Assisi with the electrified network and permits electric operation of Rome-Florence trains via Perugia. Cost of electrification, provided for by the FS

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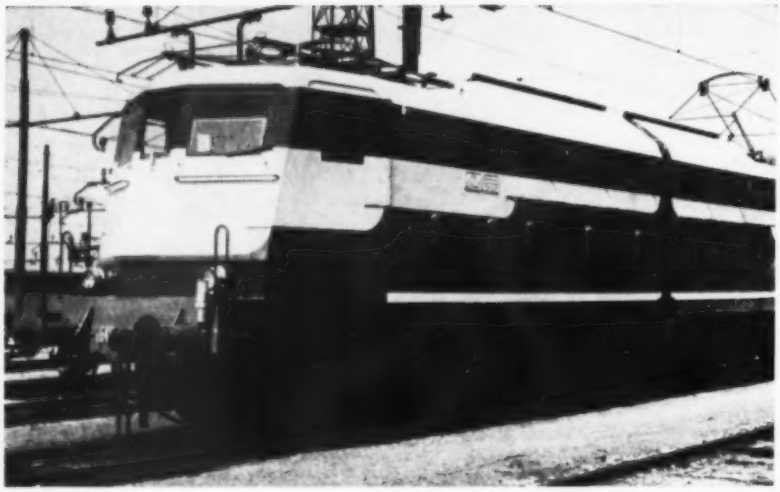
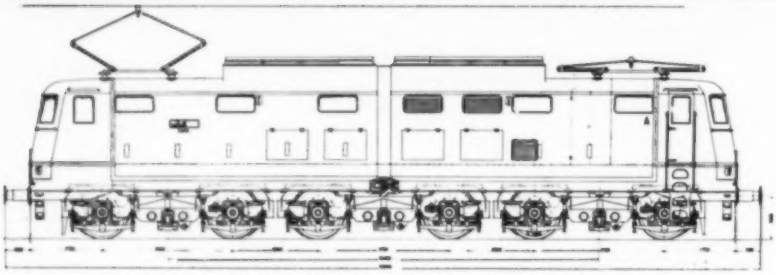
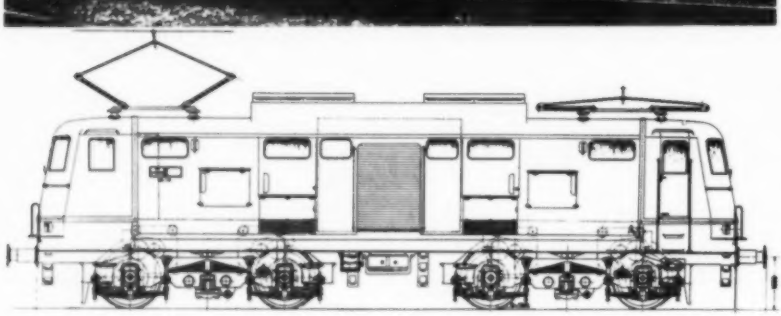




Bo-Bo-Bo E 646, above, is used for heavy traffic. E 424 Bo-Bo units, below, handle light traffic.
Bo-Bo-Bo E 646, ci-dessus, pour trafic lourd. E 424 Bo-Bo, ci-dessous pour trafic léger.
Oben: Bo-Bo-Bo E 646 für Schwergutbeförderung. Unten: E 424 Bo-Bo für Leichtgutzüge.
Bo-Bo-Bo E 646 para tráfico pesado. Unidades E 424 Bo-Bo (abajo) para tráfico ligero.



FS Electrification

five-year modernization plan, came to 1,115 million lira, with another 960 million for modifications required by the work.

The beginning of electric traction on the 100-km Torino-Novara line, expected at the end of May, will complete electrification of the Torino-Milan line, the Novara-Milan section—36 km of double track—having been completed in 1960. The cost of the Torino-Milan electrification itself is estimated at 4,630 million lira; modifications required in structures, etc., will bring the project's total cost to 8,975 million lira, exclusive of an additional 5,035 million lira required for the purchase of 29 locomotives and seven motor-trailer MU sets.

The Alessandria-Novara-Arona electrification, with a branch from Oleggio to Lavino, was completed at the same time as the Novara-Rho line. The project greatly improves transport efficiency between Genova and Switzerland, now totally electrified. The line includes 70 km of double and 68 km of single track, totaling 276 track-km. The work involved special modifications at Alessandria, located on the triphase Genova-Torino line which now is being converted to DC, as well as the building of a 116-km primary transmission line carrying 130-kv current, with a connection to the net of private company at Valenza. Financing of the 8,580 million lira project was through a loan to the FS from the Swiss Federal. Motive power will be increased by the purchase of 18 locomotives, at a cost of 2,430 million lira.

Electric operation of the entire east-coast main line in Sicily was effected with completion of the 3,095 million lira Messina-Syracuse electrification; another 1,620 million lira was spent for 12 electric locomotives for service on the line.

Other important electrification projects were completed at the close of 1960. The 127-km Mestre-Treviso-Udine line began electric operation in October, with a total of 340 track-km, at a cost of 5,255 million lira. An additional 2,630 million lira was budgeted for the purchase of 17 locomotives and three railcar-and-trailer MU sets. At the same time work ended on the 41.6-km single-track line from Castel Bolognese to Ravenna, the electrification work costing 1,210 million lira and rolling stock (two locomotives and five MU sets), 960 million lira.

With the recent completion of elec-

Has Commanding Position Among European Railways

trification work between Pistoia, Lucca and Viareggio, including the Lucca-Pisa branch (88 km of line), only one major section of new electrification remains to be finished under the present program.

Equally important, and also due for completion at the end of May, is the conversion of former triphase lines from Modan to Torino (105 km) and the branch from Bussoleno to Susa; 90 double-track km from Torino to Alessandria, with 24 km of branch line, and the 47-km single-track line from Torino to Torre Pellice. This first phase of the conversion program will be followed by conversion of three-phase lines between Alessandria, Genoa and Voghera, and between Genoa and Savin. This second phase is expected to be completed in January 1962.

Conversion of the lines in the first phase will have cost a total of 8,820 million lira and electric motive power and MU sets will add another 2,400 million.

Conversion of other lines in the Piedmont, and the isolated Bolzano-Brennero section will follow.

Locomotive Design

Italian electric-locomotive design in the early third-rail and triphase periods was characterized by extreme variety. The first (and last) 650-volt locomotives had directly-geared tram-type traction motors; the first three-phase units, two Bo-Bo locomotives, had their armatures wound directly on the axles. Rod drives, principally through articulated or triangular rods first of the Kando type and later of Italian design, followed. A wide variety of wheel arrangements resulted—0-E-0, 1-C-1, 2-C-2, 1-D-1—with sub-classes of each type. As late as 1957, with the 10,000-volt locomotives off the roster, ten different types of triphase locomotives were in use.

Triphase locomotives carried two motors, directly coupled on the 3400-volt units, geared on the industrial-current locomotives. In early locomotives only two basic speeds were obtainable; maximum speed with motors connected in parallel, half that in cascade. Even with subsequent motor designs using combinations of triphase and biphase or tetraphase current, no more than four operating speeds were possible, a major factor in the decision to abandon triphase current.

When the decision was made to use

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L'Electrification Progresse aux Chemins de Fer Italiens

Tandis que l'attention mondiale ferroviaire a été attirée par des développements récents tels que la traction courant alternatif à fréquence industrielle, les Chemins de Fer Italiens (FS) ont amplifié l'électrification à 3000 volts courant continu pour couvrir chaque ligne principale du pays. Avec 8,140 km de ligne déjà électrifiée ou achevée endéans un mois, les FS occupent à présent une place prépondérante parmi les chemins de fer européens en ce qui concerne le total en kilomètres électrifiés. Pourtant, tandis que les FS sont fiers de leur progrès en matière d'électrification, ils ont d'autres soucis. L'année fiscale terminant au 30 juin, il y aura un déficit estimé à 22,600 millions de lire. Dans un récent rapport établi par le comité d'études des Ministères du Transport et des Finances, et du Trésor, des fortes recommandations ont été énoncées pour la rationalisation de la situation financière des chemins de fer. Parmi ces recommandations citons l'abolition de plusieurs dépenses capitales actuellement effectuées par les FS. Il est toutefois certain que les recommandations du comité ne seront pas acceptées sans discussions.

Elektrifizierung der italienischen Eisenbahn

Während sich sie Aufmerksamkeit der Eisenbahnkreise allgemein auf die Elektrifizierung mit Wechselstrom richtet, beschäftigt sich die Verwaltung der italienischen Staatsbahn (FS) mit der Elektrifizierung auf 3000 Volt Gleichstrombetrieb, der alle wichtigen Hauptstrecken des Landes umfasst. Mit einer Strecke von 8.140 km, die entweder elektrifiziert ist oder innerhalb des Monats fertig wird, ist die FS heute führend unter den europäischen Eisenbahnen hinsichtlich der gesamten elektrifizierten Kilometer. Aber, während die FS stolz ist auf den Elektrifizierungsfortschritt, warten andere Probleme der Lösung. Für das Rechnungsjahr, das am 30 Juni abläuft, wird ein Eisenbahn-Defizit von 22.600 Millionen Lire erwartet. Der kürzlich erschienene Bericht einer Studienkommission, die von den Verkehrs- und Finanzministerien sowie dem Schatzamt eingesetzt wurde, enthält nachdrückliche Empfehlungen für die Rationalisierung der Finanzpolitik der Staatsbahn. Der wesentlichste Punkt dieser Empfehlungen ist, dass in dem FS-Kostenprogramm viele Kapitalsaufwendungen gestrichen werden müssen. Aber die Vorschläge der Kommission werden voraussichtlich nicht ohne weiteres angenommen.

La electrificación de los Ferrocarriles italianos hace progresos rápidos

Mientras que la atención de los ferroviarios del mundo entero se ha fijado recientemente en tales desarrollos de la electrificación como la tracción de corriente alternativa de frecuencia industrial, los Ferrocarriles del Estado italianos (FS) han extendido apresuradamente la electrificación de las líneas principales en corriente contínua de 3000 Voltios. Ahora que la electrificación de 8,140 km. ha sido terminada, los FS ocupan un puesto prominente entre los ferrocarriles europeos con respecto al total de kilómetros electrificados. Pero pese a este progreso en el terreno de la electrificación, otros problemas pertenecen. El déficit en el año fiscal que termina en el 30 de junio, se estima en 22,600 millones de liras. Una relación reciente de una comisión establecida por los Ministerios de transporte y de hacienda recomienda el saneamiento de la situación financiera del sistema. Se recomienda sobre todo suspender la realización de los proyectos en cuestión, pero las sugerencias de la comisión no se aceptarán sin discusión.

ITALIAN ELECTRIFICATION

CONTINUED

3000-volt DC, emphasis was placed on designing a relatively small number of basic units to be built in large numbers—a decision made possible largely by the flexibility of the DC traction motor.

First DC locomotive to enter service was the E 626, a Bo + Bo + Bo unit of which more than 400 were built from 1928 onward. Still widely used, the E 626 has six nose-suspended 1500-volt motors with an output of 350 kw. Motors can be connected in series, series-parallel (two groups of three motors each) or parallel (three two-motor groups). The second major design, for heavy passenger trains in level territory, was the 2-Bo + Bo-2 E 428 of 1934, in which each axle is driven by two traction motors; connection is possible in full series, series-parallel (2 × 4) or parallel (4 × 2). A light-passenger 2-Co-2 design was introduced in 1930, but only a few units were built.

Current FS electric-locomotive design stems from the E 636, introduced in 1940. The 101-ton locomotive consists of two body sections articulated at the center bogie; electrically the design is similar to the 1928 E 626. In 1957 234 units were in service; in that year the E 646 was introduced, a refinement of the same basic design.

Although projected as part of the design series for many years, the E 424 Bo-Bo unit for light traffic was not introduced until 1943, and is essentially a two-

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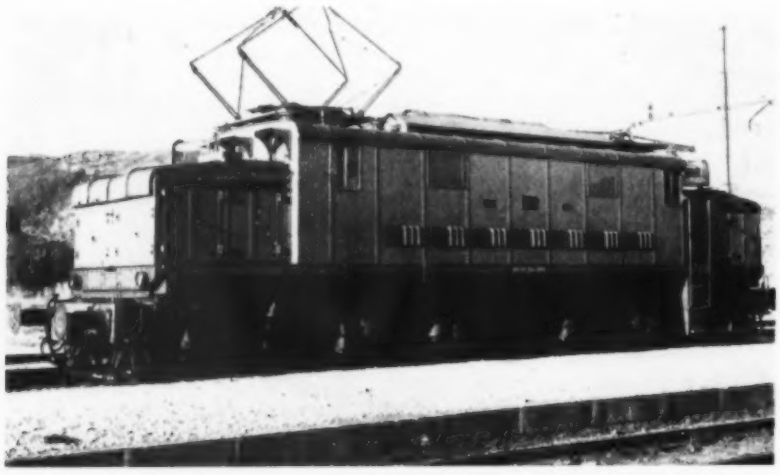
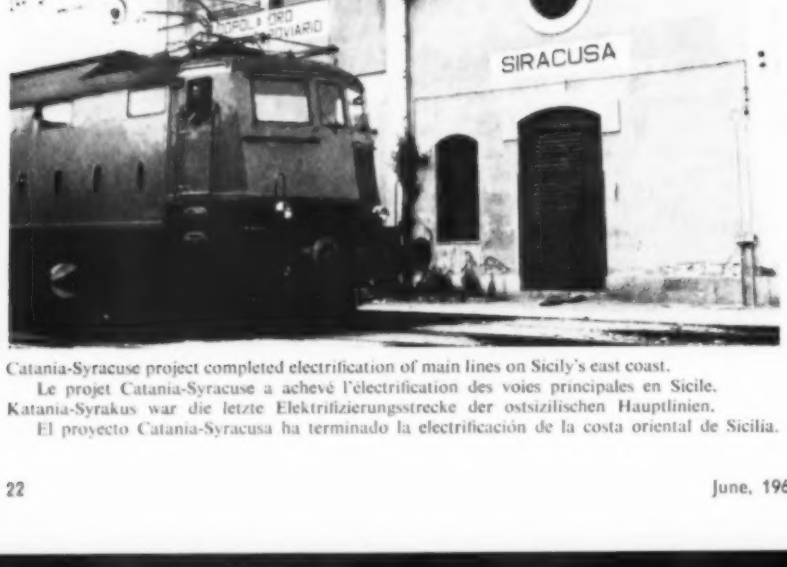


Still widely used, E 626 Bo + Bo + Bo units date from 1928; were first for 3000-volt DC.

Eléments Bo + Bo + Bo E 626 de 1928, encore couramment en usage, les premiers pour 3000 V CC.

E 626 Bo + Bo + Bo-Einheiten seit 1928 im Einsatz; sie waren die ersten für 3000 V Gleichstrom.

Bo + Bo + Bo E 626, construidas en 1928 para CC de 3000 voltios, se utilizan todavía.



Catania-Syracuse project completed electrification of main lines on Sicily's east coast.

Le projet Catania-Syracuse a achevé l'électrification des voies principales en Sicile.

Katania-Syrakus war die letzte Elektrifizierungsstrecke der ostsizilischen Hauptlinien.

El proyecto Catania-Syracusa ha terminado la electrificación de la costa oriental de Sicilia.

FS Finances Have Become

While the Italian railways are proud of their progress in electrification, other problems remain—notably, deficit operation. For the fiscal year ending this coming 30 June the deficit is expected to amount to 22,600 million lira.

The recent report of a study commission established by the ministries of transport and finance and the state treasury makes some strong recommendations toward rationalization of the railway system's financial position.

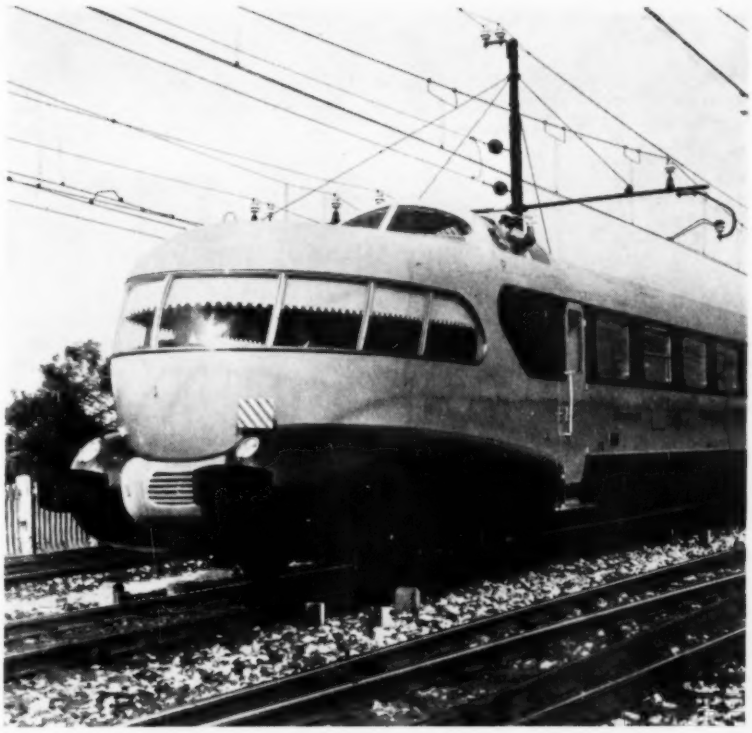
Chief among the recommendations is that the FS accounts should exclude many capital expenditures now carried. While capital improvements and acquisition of rolling stock in principle are to be financed by the treasury, the commission established that, up to the end of the 1958 fiscal year, the FS has financed through its own means a total of 1,200,000 million lira in capital improvements and rolling stock, while at the same time the balance sheet showed an accumulated deficit of 600,000 million lira.

The commission also strongly recommended that the railways be relieved of debt-service charges representing the interest on loans floated by the railways but the proceeds of which have accrued to the treasury for capital improvement programs. During the present fiscal year, for example, interest and sinking-fund provisions for loans floated so far to finance the current five-year modernization program will total 29,100 million lira. If this burden were to be transferred to the treasury, the year's railway deficit would be converted into a surplus of 6,500 million lira.

Other suggestions include the transfer of much of the railway's pension obligations to the treasury, further cutting the debit side of the system's balance sheet.

The most important question, in the commission's view, is whether the railway accounts are to be kept like those of an autonomous, commercial organization, or whether they are to

Have Become National Issue



be regarded as a branch of the government's finances. A final and clear-cut decision on the issue is regarded as imperative by the group.

In considering the projected deficit of 22,600 million lira for 1960/61, the commission noted that the amount represents a 40 per cent reduction over the 37,900 lire million deficit for 1959/60. The savings, however, do not reflect the results of operating accounts; while revenues increased by 16,100 million lira, personnel expenses rose 21,700 million. To cover the increased costs the railways count on expansion of traffic and on reductions of planned maintenance and rolling-stock acquisition, the two cutbacks resulting in a saving of 8,000 million lira. Meanwhile, subsidy from the state treasury has been fixed at 109,200 million an increase of 5,100 million from the previous year.

The question was raised whether the high level of the railway deficit was the result of the regressive structure of fares and rates, or whether—in order to cut the deficit—fares and rates should be adjusted to reflect the devaluation of the lira between 1938 and the present. It was pointed out, however, that any change in the fare structure might adversely affect traffic, especially in regard to competition from other modes of transport. The commission suggested that the competitive situation should prompt greater attention to improved technical methods and facilities.

In addition to considering the railways' financial situation, the commission also devoted attention to physical considerations.

The shortage of rolling stock came in for particular attention. Passenger coaches, for example, now number 7764, compared to 7243 in 1938/39. Even allowing for some increase in the number of seats per coach, the modest increase in numbers of 5.5 per cent is regarded as far from sufficient in view of a more than 100 per cent increase in passenger traffic.

The freight car situation is somewhat better, the fleet having increased by 19.3 per cent in the three years from 31 December 1956 to the same date in 1959. During the same period, however, total freight traffic rose considerably, and in addition the average daily distance covered by rail shipments has risen from 275 to 301 km.

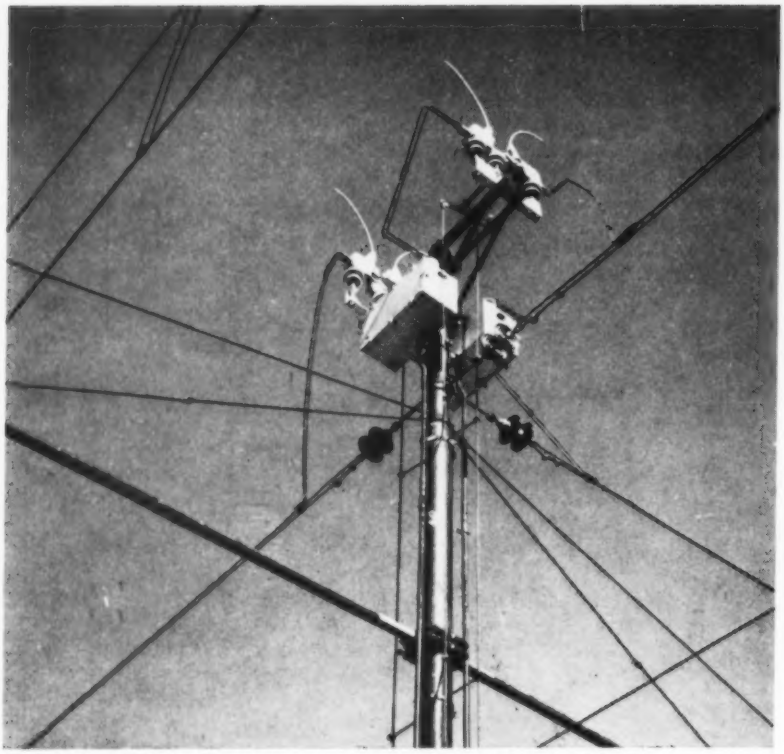
Slow turnaround of cars is accounted for to a large extent by the geographic layout of the country. The average length of haul for shipments between Sicily and the industrial north, for example, is about 1,200 km. To some degree the increase in freight train speeds during the same three years (from 27 to 31.4 km/h) has improved utilization, but the effect is somewhat lessened by the fact that increased speed has resulted in longer average shipments. Constant increase of freight rolling stock—especially of refrigerator cars needed to assure the vital export trade in citrus fruits and vegetables from southern Italy—is therefore an important goal. Here the financial situation has exerted a limiting effect.

The commission's suggestions are not apt to be accepted without question. Its recommendation that the FS resist periodic pressure for increased wages and salaries, for example, is sure to be met with a storm of protest if it results in any such action by the FS. Of immediate concern, however, is the question of uneconomic branch lines.

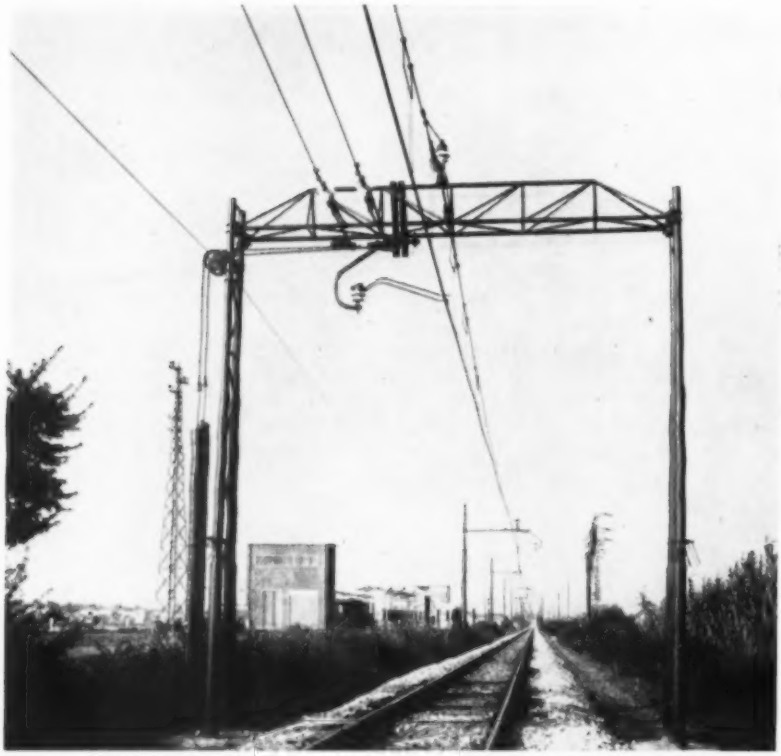
During mid-April the question erupted in the partisan press, the Socialist newspaper **Avanti** charging that the Ministry of Transport was seeking to close one third of the FS system—8,000 km—and terming the alleged proposals "scandalous favoritism toward the private bus companies."

In spite of official silence on the part of the ministry and other government departments, **Il Popolo**—official organ of the dominant Christian Democratic party—published on 10 April a reply to the **Avanti** article, stating in part: "There exists, certainly . . . the problem of (redimensioning) some of the lines with little traffic and vigorous deficits, but their suppression will not be decided upon except gradually and in relation to the possibility and convenience of securing substitute bus service corresponding to the actual needs of the public."

Whatever attempts are ultimately made to trim the FS deficit—whether by closing unprofitable lines or by other means—the current controversy is an indication of the type of political skirmishing that will be involved in attempts to rationalize FS operations.



Automatic sectioning switch on Pistoia-Lucca-Viareggio-Pisa electrification.
Poste de sectionnement automatique sur la ligne Pistoia-Lucca-Viareggio-Pisa.
Automatischer Streckenschalter auf der Strecke Pistoia-Lucca-Viareggio-Pisa.
Puesto automático de seccionamiento en la línea Pistoia-Lucca-Viareggio-Pisa.



Portal structure incorporating automatic tensioning equipment for Pescara-Sulmona line.
Portique comprenant équipement tendeur automatique pour la ligne Pescara-Sulmona.
Querträgerstruktur mit automatischer Nachspannvorrichtung für die Pescara-Sulmona-Strecke.
Estrucutura con equipo de tensor automático para la línea Pescara-Sulmona.

ITALIAN ELECTRIFICATION

CONTINUED

bogie "baby" version of the E 636, with series and parallel (1×4 or 2×2) groupings possible for the four 400-kw motors. Now under development is a 3120-kw Bo-Bo locomotive incorporating many of the improvements used in the E 646.

For passenger service in two categories—lightly-traveled lines and suburban traffic—the Italian railways early adopted the multiple unit electric railcar. Railcars, in fact, made up the first electric rolling stock on both the third-rail section and the triphase lines.

During the '30s high-speed articulated trainsets were introduced for "rapido" service on main lines; the trend reached its peak in 1953 with the introduction of the luxury "Settebello," two seven-car trains for Rome–Milan service. First conceived as tourist trains for the "high season" only, their success led to year-round service and the addition of a third set in 1959, and the building of four four-unit "Arlecchino" sets of similar design in 1960. At the same time prewar ETR 200 sets are being modified and modernized, and the ETR 240 bicurrent (triphase and DC) sets converted for DC operation only.

Recent development of MU equipment has been largely concentrated on motor-trailer combinations: the Ale 840 and trailer Le 840 were introduced in 1950 for long-distance runs; for the same service the Ale 660 and Le 800 in 1955, and the Ale 540-Le 600 combination (first-class only) in 1957. Recent additions include suburban railcars featuring maximum seating capacity, and a high-speed motor unit with coach and restaurant trailers for long-distance travel. The importance of railcars and trainsets is clear from the ten-year growth in their number, from 212 in 1950 to 367 in 1960.

Most recent development in electric traction on the FS is the introduction of electric shunting power. While small gasoline and diesel tractors have been used on the FS for many years (they now total 243) and 120 diesel shunters of larger capacity were in service in mid-1960, the bulk of shunting even in electrified territory has been carried out by steam power.

The prevalence of steam shunters, and the need for financial economy in the modernization program, has resulted in the E 321 electric shunter, a 190-kw unit which uses the frame, axles and rodding of the class 835 0-6-OT steam locomotive. Fifty units are planned, together with 10 booster units generally identical but without cabin or pantagraph.

REA's Anthony Arpaia talks about

The World-Wide Expansion of Railway Express

REA Express has been a prime mover in the development of coordinated and integrated transportation services world-wide. In international trade, perhaps even more than domestically, the savings one-agency-handling can provide are often important enough to determine whether or not trade exists at all. If the details of shipment are too costly or too complicated, only essential traffic moves.

A pioneer in providing overseas service to American shippers, REA has seen its service grow steadily. Today, REA is intensively engaged in international operations. It offers a single-bill-of-lading service covering more than 45 million origin and destination combinations, coordinated international air express, maritime freight forwarding and customs brokerage. And there is every prospect that the international services have a lot of growth ahead.

For the story on what REA is doing to keep trade flowing freely, Simmons-Boardman Corp. went to Anthony F. Arpaia, former Interstate Commerce Commissioner who became REA's vice president, international services in May 1960. Here, Mr. Arpaia tells what's happening to REA's International Department, and what's ahead.

Q. Mr. Arpaia, what is the biggest advantage REA's service has to offer over conventional international shipping?

A. Simplification. Streamlining procedures. There are two factors making for change in the traditional way of doing international business: growth of the export-import trade, and changing needs and requirements of shippers. Simplified procedures for international shipments are important to both areas.

Q. What makes international traffic so complicated?

A. One thing is the number of agents you have to deal with. With our decentralized and highly diffused system of production, most goods are not manufactured or processed at outbound port city piers, nor are they consumed or used at destination port cities.

The conventional way of handling foreign trade has been highly compartmentalized. You have to ship from your plant to the port. You have a foreign freight forwarder make the arrangements for shipping and book the steamship, overseas. The consignee must have someone to clear the shipment through customs, and someone else has to make arrangements to get the shipment from the pier to the consignee.

What a burden it makes to have separation of functions on each leg of the haul, with all the separate charges involved. Conventionally, under letter of credit arrangements for the payment of goods, the shipper must wait to progress his payment until goods are aboard the ship and an ocean bill of lading is issued.

Q. How do REA methods differ?

A. Because of our volume and because of our established facilities, REA is able to offer simpler, less complicated transportation procedures and lower total costs. REA's Through Export Bill of Lading, issued at most interior origin points, can be processed with banks immediately, when so specified in the letter of credit. So once the shipper gives us the merchandise, he can get his money. And it works both ways. The customer benefits, too. Under conventional arrangements, the customer didn't get the complete sales story. He didn't know what a shipment cost until it had been completed. REA's Through Bill of Lading moves under published tariffs. The customer wants to know what it costs to get stuff where he is. Business on a delivered price basis is the normal way. Any other basis makes it harder to do business.

The average businessman has been turning down orders abroad because of the complicated procedures he has to go through to sell overseas. You have to go through all the steps even on small orders; where you might have a profit margin of $100 on a $1,200 order, for instance, it just isn't worth it.

REA takes the mystery out of the arrangements. If a shipper wants to give us a letter of instructions and a standard invoice, we'll handle all the documentation that's necessary and give him an express receipt. That's a tremendous help to novices in this field. We're trying to get people into international trade, who've never been in the business before.

CONTINUED

Railway Express Agency's Through

Q. I can see where your service would appeal to newcomers to foreign trade. Is it as attractive to a man already in the business?

A. Yes, of course. He doesn't have to make any subordinate arrangements either. One telephone call sets up the arrangements. He has one contract for any overseas shipment; it's no harder than shipping from New York to Chillicothe.

Q. How extensive are REA international operations, and how extensive do you think they eventually will be?

A. We have service to and from 41 countries—our Through Export Bill of Lading service does—and we are closing contracts with eight additional countries. We're in the process of establishing agents in all the countries of the free world, even in the new countries. We're working very hard on them now. To the extent it's possible, we're getting the broadest coverage in the world.

Q. Is there any demand for extending Through Bill of Lading service behind the Iron Curtain?

A. No, there's no freedom of movement there anyway. We haven't tried. We do offer freight forwarder service, though, to anywhere in the world.

Q. How do you go about setting up an agency abroad?

A. In picking our agencies, we look for experience. Second, we look for reliability. We have some people who have offered to become agents that we have had to reject. They may be solvent, but they have to be more than that. They have to be secure. Our agents have to be just as dependable and reliable as the people we have here.

Our service is the only service where you can ship an article of unusual value, even classified material. We give protective signature service, armed guard service, armed surveillance service, and this means we have to pick agents who are dependable.

Q. What kind of quality control do you have over your agents? Can you guarantee transit time as well as price?

A. Of course, as far as price is concerned, rates are published, both import and export. Transit time is the service you're selling. On the Through Export Bill of Lading, we do not try to work through the cheapest service. For example, we'll ship on the first available steamship arrival. On air, also, we do the same thing; we take the first available airline space. An exception is government traffic, which has to go American flag.

Q. How does your traffic break down between military and commercial?

A. We handle a lot of military traffic. We've been developing international commercial traffic, though, and we think that commercial traffic is going to grow. Military traffic is an undependable base for building future growth.

Q. Do you give your agents minimum traffic guarantees?

A. You have different arrangements in each country. You might have minimum guarantees in some cases and not in others.

Q. How much traffic do you need to set up an agency?

A. In the beginning, you really don't have to have any specific amount. The thing that generates traffic for through bill service is the fact that it exists. It will generate its own traffic from there.

Q. Are there differences from country to country in regulation, in restrictions on letting one company provide one-package, one-ticket service?

A. Our agents are private agencies in almost every country, even where the transportation system is nationalized. The agents have complete freedom, and mostly operate the way we do here. Our agent in Germany, for instance, Schenker & Co., is a subsidiary of the German Federal Railways, but is operated independently. And in most of the countries we do business in, our agents are private. None of our contracts require government signatures.

Q. Are there any inter-company agreements between your agents for non-REA business; that is, business moving between two of your agents in foreign countries?

A. As a matter of fact, there are. Many of our agents, because they are the best established in their respective countries, do engage in business with each other, too. I see evidence occasionally that indicates the through bill system we pioneered is spreading. Even where we're not involved, the foreign companies are tending to use the single bill of lading idea.

Q. What are the size limitations on your shipments?

A. As far as we're concerned, we have nothing that limits the size of shipments except economics. A rolling mill broken down will go to a port city on an export rail freight rate. So why move it on a through express bill? But here we do give our conventional freight forwarder service from the port city or, on incoming shipments, our customs brokerage service. We have the staff, and we want to increase this type of business, too. REA is versatile. We can handle conventional customs brokerage, conventional freight forwarding, through export bill of lading, or interchange on freight movements abroad.

Q. Where do containers come in?

A. We're developing our container service. To show how the advantages are appealing, assume we have a shipper abroad who wants to ship to 30 or 40 different receivers in this country. Depending on the commodity and the volume, he can load the shipment in one, two or three containers. The shipment is containerized there; he saves on export packing, weight, damage, pilfering, time. Assume there are three containers coming through the Port of New York (it could be any of the 13 major ports). He can load each container as individual packages for different destinations. One container might come to the New York area and break bulk there for individual distribution. The second container goes to Chicago for distribution there; the third goes to Atlanta.

That is expeditious service. No other carrier can do that, because through our single carrier service we can cover any delivery situation.

Q. Have you had problems in using containers through ports where there is strong labor opposition?

A. No. Labor has a vital stake here, too. We have to have changes to stay alive. Our situation is good in the United States and Europe, but containers have not yet been tried everywhere. We have container service to and from Hong Kong, Japan, Philippine Islands, England, Denmark, Germany, Holland, France and Italy, which are the most active countries, where it is usually possible to get a two-way movement of containers. Other countries are mostly a one-way movement. It's not easy to bring a container home empty, as we would have to in shipping to some countries. Our rates assume we'll have two-way loads for the containers.

Q. How about customs?

A. We are the only carrier to have a customs inspection staff right in our own terminal in New York. There is no pier delay. It is all brought in to our own warehouse for customs inspection, which

Bill of Export Lading Now Covers Forty-one Countries

saves a lot of time, as much as five days.

Q. What kind of tariffs do you publish?

A. We have relatively simple tariffs. We want to make them as simple as we can. That's one of the advantages shippers have with us. Our tariffs are made up of three elements: the domestic express haul, the ocean haul and the inland haul at destination country. This results in a single charge, all based on published tariffs.

Q. Is further simplification likely?

A. I think so. I think rates will eventually be based on cube. You're bound to simplify tariffs this way. What else does a carrier have to sell but space? Private carriage has destroyed the old value of service concept.

Q. What kind of costing techniques are necessary to set up rates from all your US offices to the points you reach overseas?

A. The costing techniques are exactly the same as for domestic rates, up to the water's edge. Ocean rates are a known factor. Then you have standard charges for customs clearances, etc., and for land movement overseas. On the Through Bill of Lading, all are included. We don't guess about rates; we know, and the shipper and the consignee know.

Q. How do you sell your international service?

A. On this side, we sell it as part and parcel of our all-inclusive service. Every agent can take any shipment for any destination. He simply sends it to the gateway. And every sales representative sells the entire range of services. Every domestic customer with expanding trade is a customer for international service.

Overseas, we have our REA Express representative, but the selling job is done by the agents. Sometimes the importer controls the routing, sometimes the exporter.

Q. Do you use the REA emblem overseas and the REA name?

A. Yes. Most of our agents use both the REA symbol and their own. What appeals to our overseas agents is the fact that we're old and established. Our roots go back 122 years. We have coverage at the gateways. We add new gateways as needed. When we were considering changing our name, we asked our agents to comment. They said, "Do not give up the REA. It's well known overseas."

CONTINUED

Expansion Mondiale de la REA

La REA Express est une des maisons les plus importantes dans le développement des services de transports coordinés et intégrés sur une échelle mondiale. Dans le commerce international, peut être encore plus que dans le plan national, les économies que peut réaliser une seule maison d'expéditions sont souvent assez importantes pour déterminer si oui ou non il existe des possibilités de commerce. Lorsque les détails d'expéditions sont onéreux ou trop compliqués, seul le trafic essentiel se réalise. REA offre un service de connaissement unique, couvrant plus de 45 millions de combinaisons: lieu d'origine et de destination, un air express international coordiné, une agence d'expédition et en douane pour le fret maritime. Tout indique que les services internationaux se développeront encore plus. Pour savoir ce que REA fait pour maintenir un volume abondant d'expéditions internationales, la Simmons-Boardman Publishing Corp. s'est adressée à Anthony F. Arpaia, ancien Interstate Commerce Commissioner, devenu vice-président de REA, services internationaux, en mai 1960. Dans l'interview figurant dans ce numéro, M. Arpaia nous raconte l'histoire et l'avenir de REA.

REA - weltfassendes Unternehmen

REA-Express hat in der Entwicklung koordinierter und integrierter Transportdienstleistungen auf weltweiter Basis eine führende Rolle übernommen. Mehr noch als im inländischen können im internationalen Handelsverkehr Einsparungen durch die ein-Spediteur-Abfertigung erreicht werden. Wird der Versand durch die einzelnen Teilstrecken zu teuer oder zu kompliziert, dann wird der Handelsverkehr nur auf die wesentlichsten Güter beschränkt. REA bietet nun Transportdienstleistungen mit einem einzigen Frachtbrief an, der mehr als 45 Millionen Ursprungs- und Bestimmungs-Kombinationen zulässt, einschliesslich internationalem Luftexpress, Güterversand per Schiff und Zollabfertigungsgebühren. Bei dieser Methode besteht die Aussicht, dass sich die internationalen Transportdienstleistungen in aufsteigender Linie bewegen. Ein Mitarbeiter der Simmons-Boardman Corp. hat Herrn Anthony F. Arpaia, früher internationaler Handelsbevollmächtigter und seit Mai 1960 Vize-Präsident und Sachbearbeiter der internationalen Dienstleistungen der REA, über die weitere Entwicklung interviewt. In dem Interview, dass in diesem Heft erscheint, spricht Herr Arpaia über Vergangenheit und Zukunft der Internationalen Abteilung bei REA.

Expansión mundial de la Casa REA

La Casa REA Express ha jugado un papel importante en el desarrollo de la coordinación y la integración de los servicios de transporte en una escala mundial. En el comercio internacional los ahorros que el intermedio de una sola agencia puede producir, son muchas veces decisivos. Si los gastos de la expedición son demasiado elevados o si los trámites son muy complicados, sólo el tráfico esencial se mueve. La Casa REA ofrece el servicio de un solo conocimiento para más de 45 millones de combinaciones de origen y destino, transporte aéreo coordinado, flete marítimo y operaciones de aduana. Y es muy probable que los servicios internacionales crecerán más y más. Simmons Boardman Publishing Corp. ha interviuvado al Señor Anthony F. Arpaia que en el mes de mayo de 1960 fué nombrado gerente de los servicios internacionales de la REA. En esta entrevista el Sr. Arpaia informa sobre el pasado y el futuro del Departamento Internacional de la REA.

Q. Your Dor-Con-Dor service moves household goods overseas from packing at the residence to unpacking at destination. Door to door by container, as the name suggests. Are you planning to expand it from military to private shippers?

A. Yes. We are plotting our rates to cover the whole ball of wax. Our transit time checks of these collapsible containers have been very good. We're going to file rates here by states. The service will be available commercially as soon as we can get our tariffs published.

Q. How is REA Express affected by the present concern of the US Government with our balance of trade?

A. We think we're helping. We're making it possible for new businessmen to get in the field. These are people who've never been able to make it worth their while before because their costs were too high to be competitive.

Q. One last question. What's ahead for REA internationally?

A. I think we'll continue to expand and grow. We're alert to every advantage technology can muster. That's uppermost in our mind. The way to get growth is through a better service at the lowest possible cost.

REA Service Is Geared to Versatility

Talk to REA's director of international operations, William J. Wallace, and you come away with an impression of the enormous range of REA's International Department operations. Here are a few recent examples:

• A tourist from Cincinnati, traveling in England, bought a china dinner service at Harrods. The price the sales clerk quoted was for the goods delivered in Cincinnati. All that was required of the customer was information as to when he planned to return to the United States and a note that he would include the item in his exempt customs declaration.

This service and similar service with other English department stores is available on china, silverware, piece goods, knitwear, textiles, cosmetics and perfume, under a special agreement between REA and Anglo-Overseas Transport, REA's British agent. Traffic is containerized in England, brought to the Port of New York by ocean shipment, moved directly to REA's International Terminal for inspection by the Customs station inspector permanently stationed there, and forwarded to destination by domestic express.

Similar services are offered, or soon will be offered, in Denmark, France and Germany. The price to the customer includes packing, domestic transport, customs clearance, ocean haul, clearance here and delivery to door.

"It's very attractive to tourists," Mr. Wallace notes.

• A San Antonio firm purchased a lot of artificial flowers in Hong Kong, to be delivered on a Through Export Bill of Lading in REA's Strick-Tainers. The shipment left Hong Kong aboard American President Lines S. S. President Fillmore 22 Dec. 1960, due at the Port of Los Angeles, 7 Jan. 1961. The original instructions were to move the Strick-Tainers on highway bogeys over the road from Long Beach to Los Angeles, then by piggyback to San Antonio.

The market situation changed while the shipment was under way, however. Before it arrived at port, the consignee decided to forego shipping the container intact to San Antonio in favor of breaking bulk at Los Angeles to make dispersed express delivery from there.

"This gives you an idea of our flexibility," Mr. Wallace says. "We could handle it either way, whichever was best for the customer."

• A Syracuse manufacturer had a medium-size shipment for Turkey. Under REA's Through Export Bill of Lading, he was furnished a 6.75 m^3 container at his loading dock. This moved in regular REA service to New York, where REA put it on the first available steamship for Istanbul. After customs clearance, the shipment was delivered by REA's agent in Turkey, H. W. Fuestel, to the consignee. "Time was under 30 days," Mr. Wallace comments, "complete cost to the shipper, Syracuse to Istanbul, delivered, was $611.65."

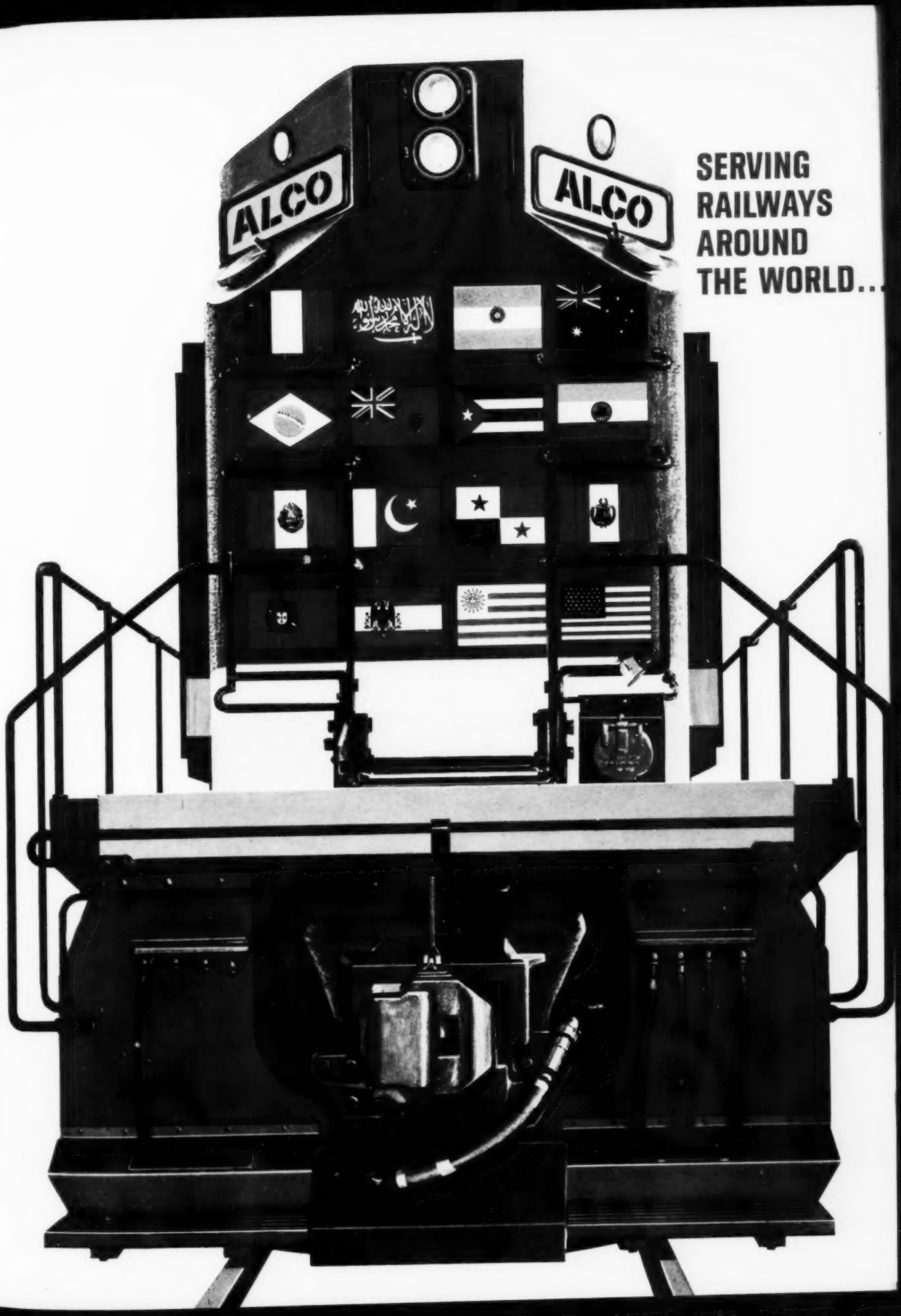
• An Army officer transferred to Germany, from a Texas base, had his private baggage delivered in 19 days. Under previous shipping procedures the shipment would have required about 40 days.

Since 1957, REA has been handling in its World Thruway Service unaccompanied movement of baggage and effects of military personnel moving to and from armed forces bases in Europe and the Far East. This baggage delivery system, called "Pribag," has saved time and money for the military, Mr. Wallace says, by effecting delivery in half the time required for previous military or multiple private carrier services. The nationwide REA Express network serves all military base areas in the United States and, through its agents abroad, REA also serves overseas bases. When the ocean haul is by regular steamship, containers are used for this service. REA has provided truck trailers as containers for military roll-on, roll-off ships.

• An Air Force Captain was transferred from Stewart Air Force Base, Newburgh, N.Y., to an Air Force installation at Essex, England. His family and household belongings went with him. Special fibreboard containers were provided by REA at the serviceman's Newburgh home, where professional packers stowed his dishes, appliances, small furniture, clothing and other personal effects in special drums and cartons, then into the "Dor-Con-Dor" containers. The boxes were sealed, moved overseas by REA, and delivered sealed at the new residence for the contents to be unpacked.

"This service started on a four-month experimental basis," says Mr. Wallace. "It saves at least ten days in actual origin-destination delivery time, compared with conventional tandem handling methods via multiple carrier services." The Dor-Con-Dor containers are made of triple-walled, water-resistant corrugated fibreboard. Packed, they are steelbanded to a wooden base. The boxes are 2.28 m long, 1.83 m high and 1.09 m wide. "They are very satisfactory," Mr. Wallace reports, "except when somebody wants to take his roof-top television aerial with him." The service is likely to be extended commercially soon.

• ICA shipments to Laos have been a difficult problem, with the current unrest in that country. Because Laos is landlocked, shipments have to go through Bangkok or Saigon, and there were many opportunities for diversion and pilferage. Recently, a contract was negotiated with ICA providing that Laos shipments be made on an REA Through Export Bill of Lading. The REA agent for Laos is the same as for Thailand, Express Transportation Organization of Thailand, but on the REA Bill, Thai customs accepted the Bill as proof that the shipments were in-transit goods and no customs were assessed at the ports. "The guaranteed delivery appealed to the ICA," Mr. Wallace reports.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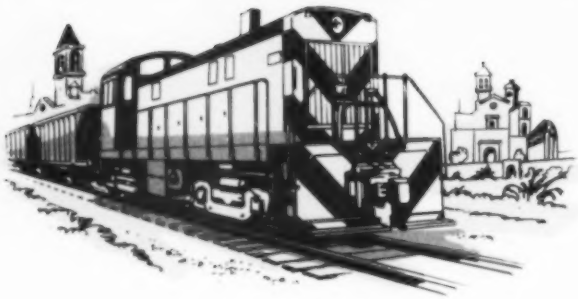
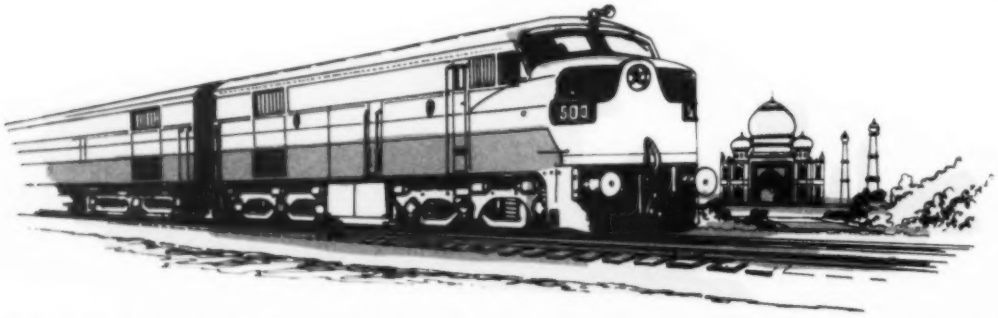
SERVING
RAILWAYS
AROUND
THE WORLD...

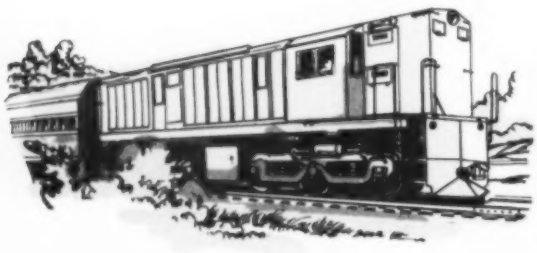


DL-430 FOR SHUNTING, TRANSFER AND BRANCHLINE SERVICE, FROM 22.2 METRIC TONS PER AXLE, GAUGES: 4'8½" AND OVER. **975/900 HP**

DL-531 – LIGHT WEIGHT, REDUCED CLEARANCE LOCOMOTIVE FOR PASSENGER, FREIGHT AND SHUNTING SERVICE, FROM 11.3 METRIC TONS PER AXLE, GAUGES: METER AND OVER (36" ON SPECIAL DESIGN). **1050/950 HP**



DL-500-C – FOR PASSENGER AND FREIGHT SERVICE, MEETING THE BERNE INTERNATIONAL CLEARANCE DIAGRAM, FROM 16 METRIC TONS PER AXLE, GAUGES: METER AND OVER. **1950/1800 HP**



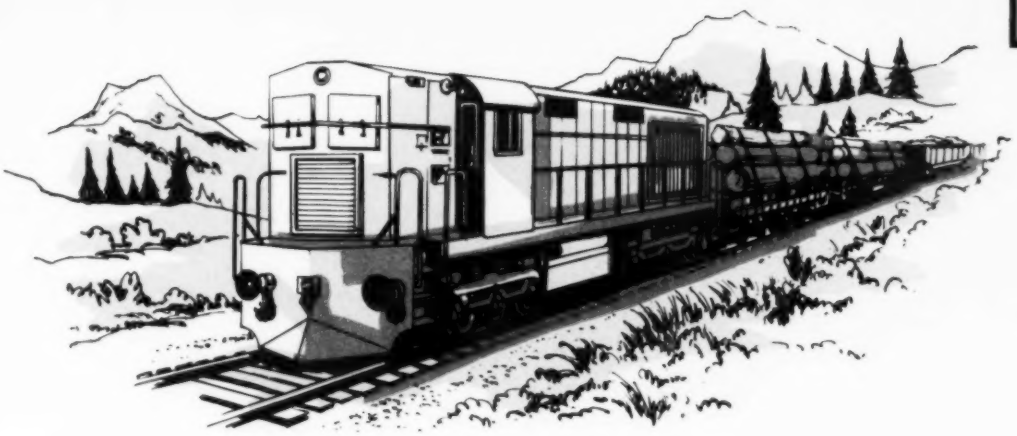
DL-535 – MEDIUM-POWERED, MULTIPURPOSE LOCOMOTIVE BUILT TO EXTREMELY REDUCED CLEARANCES, FROM 11.25 METRIC TONS PER AXLE, GAUGES: METER AND OVER (36" ON SPECIAL DESIGN). **1365/1200 HP**

DL-701 – MAINLINE PASSENGER AND FREIGHT SERVICE, FROM 27.2 METRIC TONS PER AXLE, GAUGES: 4'8½" AND OVER. **1950/1800 HP**

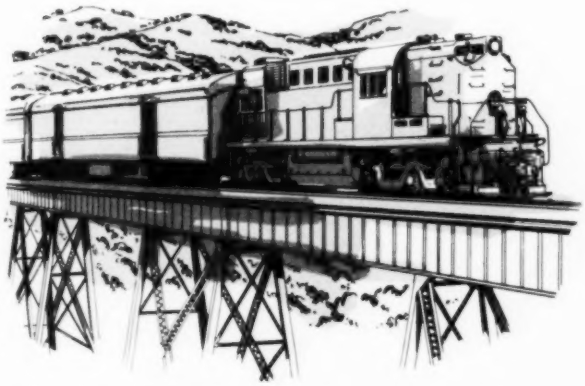
DL-541 – MULTIPURPOSE LOCOMOTIVE MEETING RESTRICTED CLEARANCES, FROM 16 METRIC TONS PER AXLE, GAUGES: METER AND OVER. **1950/1800 HP**

Horsepower ratings are under standard conditions.

ALCO



DL-560 – SIX MOTOR MAINLINE LOCOMOTIVE OF RESTRICTED CLEARANCES, FROM 19.6 METRIC TONS PER AXLE, GAUGES: METER AND OVER. **2600/2400 HP**



DL-702 – SIX MOTOR MAINLINE FOR PASSENGER AND FREIGHT SERVICE WHERE VERY HIGH TRACTIVE EFFORTS ARE DESIRED, FROM 21.5 METRIC TONS PER AXLE, GAUGES: 4'8½" AND OVER. **1950/1800 HP**

DL-600 – SIX MOTOR MAINLINE LOCOMOTIVE COMBINING HIGH HORSEPOWER WITH VERY HIGH TRACTIVE EFFORTS, FROM 25.3 METRIC TONS PER AXLE, GAUGES 4'8½" AND OVER. **2600/2400 HP**

ALCO LOCOMOTIVES COMBINE THE PROVEN MODEL 251 ENGINE WITH WELL-TRIED BOGIES OF HIGH ADHESION

ALCO locomotives are powered by the modern Model 251 engine, a product of over twenty-five years' development of high-power, turbo-supercharged engines designed primarily for railway traction. This development work is continuing to offer railways even higher power, greater economy and dependability.

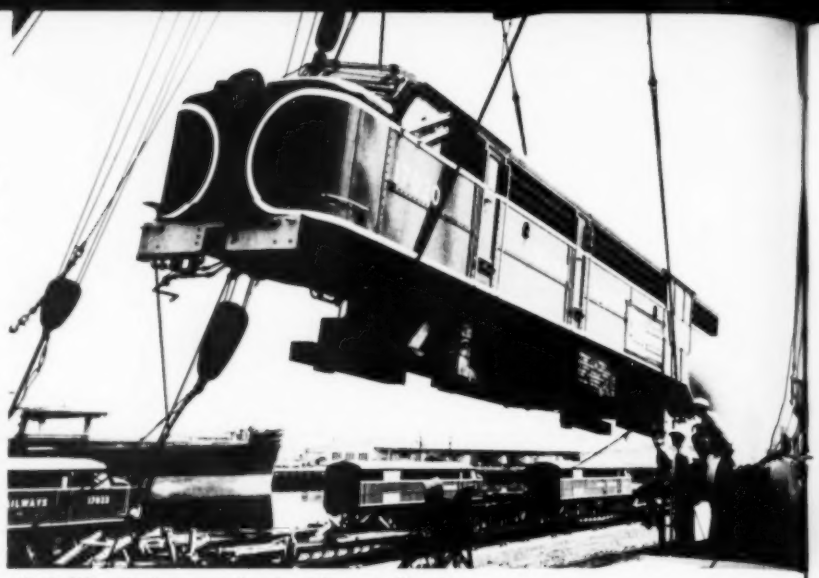
The 251 engine follows a four-stroke, highly turbo-supercharged and aftercooled cycle, the one offering the highest thermal efficiency. Extensive tests on U.S.A. and overseas railways have proved that ALCO locomotives consume less fuel than any others in similar service.

Some of the outstanding features which give the ALCO 251 engine exceptionally long and economical life are: grooveless bearings; two-piece aluminum pistons with a hard, Ni-Resist insert for the top-ring groove; chromium-plated cylinder liners; replaceable hard-alloy valve-seat inserts; careful study of lubricating and cooling requirements; an exceptionally strong welded steel crankcase; and a hardened forged-steel crankshaft.

Many railways are finding that in heavy-duty service, they can space inspections of 251 pistons, rings, cylinders, valves and bearings from 36 to 48 months apart.

Another reason for the increasing acceptance of ALCO locomotives is the cast-steel fully equalized bogies, proven on all kinds of tracks. In particular, the three-axle ALCO trimount bogie allows for very high adhesion, a fact of importance where low or moderate axle loads are specified.

353 RAILWAYS IN 16 COUNTRIES CHOOSE ALCO LOCOMOTIVES



ALCO DL-500-C locomotive bound for India, for the haulage of heavy trains in graded sections.

Since 1848, ALCO has been serving railways the world over. As the American Locomotive Company, it was the world's leading builder of steam locomotives.

In 1924 ALCO built the first commercially successful diesel-electric locomotive manufactured in the U.S.A. It gave more than thirty-seven years of economical service. Since then, ALCO has built more than 20 million diesel horsepower.

The ALCO line of locomotives now offers models covering a wide power range, both for the generous clearances and axleloads in the U.S.A. and some other countries, and for the restricted axleloads and maximum dimensions found in many other railways of the world. In fact, a total of 353 railways in 16 countries have chosen ALCO diesel-electrics.

ALCO's most recent locomotive catalog contains specifications, tractive-effort curves and drawings of all ALCO locomotives. Write the ALCO office or associate nearest you, for a free copy.

SOME USERS OF ALCO LOCOMOTIVES

In Algeria	Algerian Railways
In Argentina	F.C. General Mitre F.C. General Sarmiento F.C. General San Martin
In Australia	New South Wales Government Railways South Australia Government Railways Silverton Tramways
In Brasil	Central Railway of Brasil Paulista Railway Company Rede Ferroviaria Federal S.A. Santos a Jundiai Railway
In Canada	Canadian Pacific Railway Canadian National Railways
In Cuba	Consolidated Railways of Cuba Nickel Processing Company
In England	Steel Company of Wales
In India	Indian Railways
In Mexico	National Railways of Mexico Ferrocarril Mexicano Altos Hornos de Mexico SA Cia Fundidora de Hierro y Acero de Monterrey F.C. del Sureste F.C. Sonora Baja California F.C. Pacifico F.C. Chihuahua-Pacifico Secretaria de Marina Cia de Cementos de Mixcoac
In Pakistan	North Western Railway
In Panama	Panama Canal Company
In Peru	F.C. Sur (Peruvian Corporation) Southern Peru Copper Corporation
In Portugal	Portuguese State Railways
In Saudi Arabia	Saudi Arabia Government Railways
In Spain	Red Nacional de los Ferrocarriles Españoles
In Uruguay	State Railways Administration

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BR Modernization Conference

The ambitious modernization plan of the British Railways is moving ahead, but not without its share of problems. This was made quite clear at a two-day joint conference of the Institutions of Civil, Mechanical and Electrical Engineers held in London last month, and attended by more than 1,000 delegates.

The main engineering aspects of the BR modernization plan were covered by R. C. Bond, Technical Adviser to the British Transport Commission, in the first of five papers presented to the conference. These included replacement of steam by diesel and electric traction, improvements to track, new passenger stations and freight terminals, modernization of the signaling and telecommunications network, replacement of many existing passenger cars, introduction of larger freight cars, the fitting of rolling stock with vacuum brakes and the construction of new mechanized marshaling yards.

In reaching a decision on dieselization, said Mr. Bond, progress in other countries was followed closely, and first-hand knowledge gained by visits to European countries and the US.

In respect to standard of performance and reliability, said Bond, electric traction is the best means yet devised for operating a major railway system. But 4,000 route miles (6277 km) in Britain carry traffic which, at their present and probable densities, are above the level at which a sound economic case for electrification can be established.

Advantages of single-phase high-volt-

CONTINUED

Conférence de Modernisation des Chemins de Fer Britanniques

Le plan ambitieux de modernisation aux chemins de fer anglais progresse mais non sans poser de problèmes, telle est la conclusion de la conférence de deux jours des ingénieurs civil, électricien et en mécanique tenue à Londres le mois passé avec plus de 1,000 participants. Cinq rapports furent présentés avant la conférence concernant le programme de modernisation, comprenant la dieselisation, amélioration des voies, nouvelles gares pour voyageurs et marchandises, l'introduction de wagons plus grands, équiper le matériel roulant avec freins à vide, et la construction d'installations mécanisées de triage.

Modernisierungskonferenz der britischen Eisenbahn

Der grosszügige Modernisierungsplan der britischen Eisenbahn befindet sich zwar in vorwärts strebender Linie aber er ist nicht ohne Probleme. Dieses zeigte sich deutlich auf der zweitägigen Konferenz verschiedener Gruppen der Bau-, Maschinen- und Elektroingenieurverbände, die kürzlich in London stattfand. In den fünf Exposés, die vor der Konferenz eingereicht waren, wurden die technischen Gesichtspunkte des Modernisierungsprogramms, einschliesslich Verdieselung, Streckenverbesserungen, Anlagen neuer Bahnhöfe für Personen- und Güterverkehr, Einführung grösserer Güterwagen, Vakuumbremsvorrichtungen für das Rollmaterial und Konstruktion mechanisierter Rangierbahnhöfe, behandelt.

Conferencia sobre la modernización de los Ferrocarriles británicos

El plan de modernizar los Ferrocarriles británicos está desarrollándose y se tropeza con muchos problemas. Fueron discutidos en una conferencia de las Instituciones de ingenieros civiles, mecánicos y electrotécnicos que se celebró en Londres el mes pasado. En cinco disertaciones fueron referidos todos los aspectos del plan, incluso la dieselización, el mejoramiento de la vía, nuevas estaciones terminales para pasajeros y carga, la introducción de vagones más grandes, el equipar el material rodante con frenos de vacío y la construcción de nuevas estaciones de clasificación.

age AC, adopted by BR, are lower power cost, more reliable supply, lower maintenance costs. Overhead equipment is lighter and less expensive than for DC. Alterations to bridges and tunnels to provide adequate clearance are more expensive than for DC. But transformer-fed AC locomotives, with their motors permanently connected in parallel, are able to utilize the available adhesion to better effect under all conditions than DC units which require motors to be connected in series where maximum tractive effort is required. For the same performance in traffic, AC locomotives can be lighter than their DC equivalents.

With dieselization, reported Bond, 2963 steam locomotives, averaging 31,100 miles (about 50,000 km) a year, are being replaced by 1434 diesels, which will run 63,600 miles (about 102,200 km) per year. It is expected by the end of 1963, approximately 2500 main-line and 2000 shunting diesel locomotives will be at work.

A great deal of work, said Bond, has been done to strengthen the track formation, particularly where the railway has been constructed on a clay sub-soil. Extensive programs of blanketing in which weak formation is removed and replaced by sand or quarry dust have been undertaken.

Long-welded rails on pre-stressed concrete sleepers as the main-line track standard for general use have been adopted. Depots for the production of long-welded rail have been established which should result in an output of approximately 320 miles (515 km) of welded track a year.

Modern signaling is necessary in order to deal with the higher speeds and more intensive services proposed in the modernization plan. So far more than 300 track miles (about 500 km) have been equipped with color-light signals and 50 new signal boxes have replaced 250 old ones. During the next few years color-light signals will be installed on a further 3000 miles (about 5000 km) of track and 125 new signal boxes will replace 700 which will be closed.

Other important activities of the signaling department include the installation of the automatic warning system of train control; modifications to signaling equipment as a result of the introduction of 25 kv electrification; the signaling of new hump marshaling yards and the provision of electronic control equipment for the electro-pneumatic retarders; and the modernization of telecommunications.

The vital importance of research and

CONTINUED

Widespread Diesel Introduction:

When current orders are completed, requirements under the British Railways modernization program for diesel shunters and multiple-unit power cars will be nearly completed. About 66% of the estimated main line locomotive requirements will have been met by 1963. The following, condensed from a paper presented at the Railway Modernization Conference by Mr. John Harrison, Chief Mechanical Engineer, British Transport Commission, summarizes BR's experience with the widespread introduction of diesel traction.

As more diesel units have come into service and as more has been learned about performance potential, traffic uses, and utilization problems generally, the following trends away from the original conception have emerged.

In buying at first prototypes from practically every experienced manufacturer in Britain, it was thought that they might grade themselves fairly rapidly in technical order of merit, thus permitting early elimination of the less satisfactory makes. Teething troubles have been present with all makes of equipment, but in most cases these can be, and are being, overcome by varying degrees of effort. There are, therefore, few equipments by experienced manufacturers which are likely to prove incapable in the long run of reliable traction work. On the other hand, for lowest first cost, for ease of training, and for economic maintenance, it is important to reduce variety as far as practicable, so that in the outcome, decisions have been made to order a limited range.

Except in the case of the 350-hp shunter, where a standard design of mechanical parts already existed, it was decided, after the fullest consideration, not to develop standard designs of mechanical parts for main-line locomotives. The different designs of locomotives and railcar chassis already in being are so generally satisfactory that the policy is to select one or other of them as they stand for future construction, and not to embark on redesign for the sake of standardization.

Within this decision is included, however, standardization of consumable details such as tires, brake blocks, pins and bushes, buffers and drawgear, etc. These standards are generally the same as for steam locomotives.

In two out of the five types originally established, experience has indicated the need for change. These are:

(a) Type 1. These locomotives cover combined shunting and trip working, and those so far delivered have medium-speed engines of 800–1,000 hp placed in high bonnets ahead of a single end cab. Vision in forward movement on the main line limits one-man operation, and new designs are now under consideration to permit a raised cab with low bonnet to give all-round vision. Latest design will have a center cab and two 450-hp engines under low hoods.

(b) Type 4. Arising from existing equipment and designs available in 1954, the type 4 locomotive was developed with the 1-CC-1 wheel arrangement at a weight of about 130 tons. This was not a mistake, but the only way at the time of combining available medium-speed engines, train heating and 18.5 tons axle loading. Besides being uneconomically heavy, these locomotives will not traverse vehicle humps in marshaling yards, so that their full utilization in mixed traffic working is limited. Future locomotives of this type will therefore be of CC wheel arrangement within the weight of 114 tons, having either one slow-speed or two high-speed engines.

The range of powers originally proposed was based upon the power of available engines at that time and has been found to meet operating needs fairly successfully. The two powers of flat automotive-type diesel-engine on railcars, namely 150 and 230 hp were found adequately to cover the whole range of requirements in differing combinations of power and trailer cars in multiple units. The same is true also of the 600-hp vertical engines used in diesel-electric multiple-unit train sets. Usually 350 hp is adequate for all yard shunters duties, and where trip working on the main line is concerned, where speeds up to 60 m/ph are called for to get out of the way of main-line trains in general, there is only limited scope for anything less than 800 hp in the

BR's Experience and Findings

next stage. At the other end of the scale, 2,000 hp in type 4, being closely equivalent to Class 7 steam engines, does not quite meet the most onerous requirements of heavy fast trains, formerly worked by Class 8 steam, and locomotives having 2,500–2,700 hp available for traction are also required.

Shunting locomotives, by reason of their background of more than 20 years' painstaking development and their low load factor, give almost complete reliability and offer no problems. Main-line locomotives and railcars are proving themselves excellent performers in the handling of trains. Their superior acceleration power and absence of any limit to their output owing to the human element makes them welcome to the traffic department. This satisfaction is tempered by teething troubles affecting all types and makes of equipment, and which world-wide experience has shown to be inevitable in the large-scale introduction of new forms of power. Unlike the motor or aircraft industries, railways cannot develop their new products in private, and initial running to the stage of solving teething troubles must be carried out on the line in the full public gaze. Notwithstanding the experiences which are outlined above, it is perhaps a matter for congratulation that so many units are running so well, considering the magnitude and rapidity of the change. (Seven years ago there were seven main-line diesels in use on BR. Now it has the largest concentration of diesel power outside the USA).

These are matters which are particular to the physical and traffic pattern of each country so that there is little profit here in comparison with America or Germany or anywhere else. As regards availability, which it is the responsibility of the Chief Mechanical Engineer to assure, figures up to 90% could be expected from a fleet under constant refreshment with new power, and in which few units had yet attained a mileage for major repairs. On the other hand, teething troubles and rectification of initial defects have so far persistently reduced the number of units available for traffic. Only hard work under many headings will gradually clear away the volume of *ad hoc* troubles and permit a characteristic availability to appear. This could well settle down eventually to about 85%.

Utilization is perhaps the most complex aspect of operation, for there are physical limitations such as convenience of travelers and traders, turn round facilities at terminals, and the nature of traffics and routes, which limit miles and hours quite independently of the ability of the locomotive to perform. Where, as is so often the case in this interim period, mixed steam and diesel working occurs, utilization is still largely tied down to the needs of steam.

Nothing can be so misleading as a superficial reading of casualty figures, and it is necessary to understand exactly what they reflect. On British Railways a casualty is any defect causing failure to work the train, or a delay of more than 5 minutes on passenger working and 10 minutes on freight.

The number of defects per given locomotive or power unit per period is subject to contrary influences as follows:

(a) There is no make or type of locomotive or powered railcar which has not been the subject of a variety of teething troubles accentuated, of course, by initial unfamiliarity of driving and maintenance staff with the new motive power, despite the most careful training. This is a feature common to the introduction of new power everywhere, in automobiles and aircraft, in America and Europe as well as Britain.

(b) Apart from the teething troubles, defects are more prevalent in proportion to the average speed of the service worked, and to the value of the load factor. Thus there is no comparison, for example, whether under steam, diesel, or electric traction, between the incidence of defects in shunting and pick-up freight working on the one hand, and in heavy express passenger working on the other, and the wide difference is something quite separate from the relative merits of particular power units.

(c) The number of defects can be expected to increase as a given power unit approaches its laid down period of general overhaul.

The defects which occur, can be classified as follows:

(a) For hydraulic-transmission locomotives, electrical control gear, and auxiliary apparatus is by far the highest

contributor, with engines and steam heating next. For locomotives with electric-transmission engines, auxiliary electrical equipment and controls and steam heating are of approximately equal proportions with the latter predominating.

(b) A high proportion of the engine casualties arise on some only of the diesel engines in use, where the makers have for one reason or another encountered particular difficulty in applying existings designs of engines to traction work in Britain.

The lessons being learned from the experience in service can be listed as follows:

- No clear choice between high-speed or medium-speed engines, or between electric and hydraulic transmissions has yet emerged.
- Limitation in variety for production series is essential. This must be coupled with a very open-minded attitude to trials of new prototypes.
- Technical standardization is obviously essential for consumable details, and desirable for drivers' controls. Standardization of locomotives by types is essential. Standardization of appearance is a matter of opinion. It is achieved in the electric locomotives, but not in the diesels, but neither solution has much bearing on the running of a railway.
- Mechanical parts are trouble free over a wide range of designs. Until reliability has been established on an axiomatic basis, minimum power/weight ratio for locomotives is only a secondary objective.

Two wiring trains work side by side on converging lines outside Liverpool Street station.
Deux trains de montage électrique au delà de la gare de Liverpool Street, à Londres.
Zwei Leitungsmontagezüge arbeiten parallel auf der Strecke ausserhalb Liverpool Street Bahnhof.
Dos trenes de montaje fuera de Liverpool Street Station en Londres.

development has been recognized by the provision of new research laboratories and units for developing and analyzing the performance of new equipment more rapidly than is possible when this work is undertaken in production shops. By reason of their participation in the activities of the Office of Research and Experiments (ORE) of the UIC, and by membership in many research associations, BR are able to apply to their own problems the results of work going on in many other fields.

In a paper entitled "The Contribution of Civil Engineering to the BR Modernization Plan," Mr. M. G. R. Smith, chief civil engineer, Western Region of British Railways, dealt with the main civil engineering works arising out of the modernization plan.

Among the problems that have been faced is that of dealing with bridges in connection with 25-kv electrification to enable the necessary clearances to be obtained. The methods included lowering or slewing tracks, raising bridge decks, reconstruction of arches or decks, the stripping of lower arch rings, and in tunnels the rebuilding to new contours and cutting pockets to house insulation and electrical support assemblies.

Problem for British engineers is securing sufficient overhead clearance for electrification.
Le problème des ingénieurs est d'assurer une hauteur libre suffisante pour l'électrification.
Der Spielraum für die Oberleitung der Elektrifizierung ist ein Problem der britischen Ingenieure.
Hay que tener en quenta suficiente altura libre para la electrificación.

Considerable stress is being placed on research and development which are fundamentally important if the expenditure under the plan is to be considered as money well spent. An example was the stabilization of embankments (and of slips in cuttings) by pressure injection of aerated grout which had developed from research into routine. It has now been done in more than 130 places and BR staff are advising Continental railways in these methods, which in suitable cases can cost less than one-sixth of more orthodox methods.

Considerable economies, pointed out Smith, have been achieved with mechanization. For example, the approximate labor cost per mile for manual track laying was £2000. When mechanized, this figure dropped to £1500.

Mr. S. B. Warder, Chief Electrical Engineer, BTC, in a paper entitled "Electric Traction in the BR Modernization Plan," reported on the difficulties with the northeast London AC lines and the withdrawal of AC electric traction from the Glasgow suburban lines.

Mr. Warder was able to explain how narrow the margin had been on the latter between success and failure. He was also able to report that it was hoped to restore electric traction in the Glasgow area in the summer. Re-equipped trains were now running trials.

Unlike the French railways, BR had been forced to inaugurate some of their earliest 25-kv projects on densely trafficked suburban lines which placed the greatest possible demand on all equipment. Because of BR's more restricted loading gauge and the many tunnels and bridges encountered in the areas which were being electrified, this pioneered the two-voltage system. This made use of 25 kv on relatively open stretches of line and 6.25 kv on the more difficult sections. Changeover was automatic and the solution of the two voltage arrangement has played a major part in overcoming immense engineering problems.

Another major engineering feat was the conversion of the existing London (Liverpool Street), Shenfield and South-

end line from 1500-volts DC to high voltage AC. It was found possible to operate the existing 1500-volts DC system at 6.25 kv AC without substantial alteration. The final change-over was affected over one weekend—commuters traveling below 1500-volts DC catenary on Friday and under 6.25 kv AC catenary on Monday.

The final paper of the conference was presented by J. F. H. Tyler, Chief Signal and Telecommunications Engineer, Southern Region, British Railways. It discussed, in general terms, the reasons why the modernization plan involves so much signaling and telecommunication work, and described, in some detail, the apparatus which has been developed to safeguard signaling from false operation owing to interference by 50-cycle electrification.

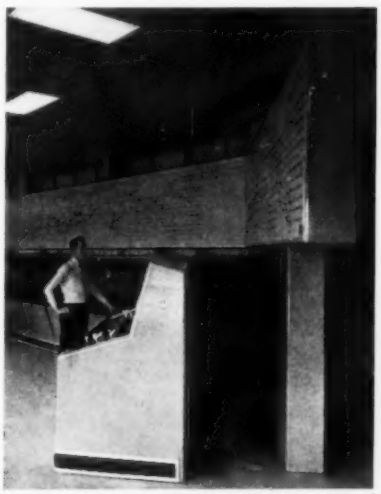
In discussing the types of signaling control panels which have been installed, or are projected, Mr. Tyler referred to the various methods of operation, including the following:

- A multi-position switch located at the entrance end of a route from one signal to another. Each position of the switch corresponds to a particular route, and selects, at a running signal with subsidiary signal on the same post, which of the two signals shall clear.
- A single two-position switch provided for each route from each signal. This is the "OCS" system.
- A combination of the above two to reduce the number of switch positions or switches.
- A single two- or three-position switch at the entrance of each route used in combination with a push button at the exit end of each route. (The original "NX" system).
- A push-button at the entrance of each route, used in combination with a push button at the exit end of each route. (The "DP" system).

In connection with the conference the BTC arranged an exhibition at the Institution of Civil Engineers. The items featured included the following:

- Rail fastening for use with concrete sleepers.
- Prefabricated half-through type girder bridge. This design combines the best possible use of welded fabrication under workshop conditions and close supervision, with simple site connections made quickly and easily without the need for skilled labor.
- Models of the new Leeds City station and London (Cannon Street) station development.
- New stations at Harlow and Barking and the combined over and under passes at Barking.
- Westronic multi-station CTC system. This consists essentially of function equipment together with any required number of field stations, each of which controls and indicates as many functions as are required at any particular location. The whole system is linked by two line wires terminating at the office. All the coding action of this equipment is carried out by transistors. Relays are needed only for transmission control and function registry purposes.
- Models of electric and diesel locomotives and diesel train-sets.
- Other items: continuous welded rail-recording of track movement, the Rugby flyover, typical neutral section installed in connection with AC electrification, automatic warning system for train control, AEI-GRS remote control system specially designed for CTC purposes, modern signaling relays, electro-pneumatic point control valve, color-light signals, Domino control panel and SGE "immunised" track circuits.

Bridges are prefabricated in the workshops with simple site connections.
Ponts préfabriqués aux ateliers avec connections simples d'emplacement.
Brücken werden in den Fabriken mit einfachen Konstruktionsverbindungen vorgeformt.
Los puentes son prefabricados en los talleres, se colocan de manera sencilla.



At left, modern signaling installation at Manchester. Right, new 25-kv AC electrification.
A gauche, installation de signalisation moderne à Manchester. A droite, nouvelle 25 kv AC.
Links: Modernes Signalsystem in Manchester. Rechts: Neue 25-kV Wechselstrom-Elektrifizierung.
A la izq., instalación de señalización en Manchester. A la der. electrificación 25 kv AC.

Turkey Begins to Dieselize

Recent approval of a $10 million loan to the Turkish State Railways (TCDD) from the US Development Loan Fund has paved the way for the first stage in conversion of the system's main line operations from steam to diesel motive power. The loan will provide funds for 32 locomotives, to be purchased in the United States, and equipment for a new diesel maintenance shop now under construction near Ankara.

The 32 locomotives, which will probably be of the 1980/1800 hp, C-C, diesel-electric type, will be placed in service on the 576-km Haydarpasa (Istanbul)—Ankara main line. They will operate between the two terminals on express passenger trains and some freights, and on other passenger and freight trains over the 314-km Haydarpasa-Eskisehir portion of the line. The latter includes the most difficult operating conditions encountered between Istanbul and Ankara. TCDD motive power men estimate that a total of 62 units would be required for complete conversion of the line.

The entire first stage in the dieselization of the TCDD system will include complete conversion of the Haydarpasa-Ankara main line, and the 485-km line from Ankara to the Black Sea port of Zonguldak, which transports heavy coal and ore traffic to Turkey's only steel mill, at Karabuk, and heavy coal traffic from mines at Zonguldak. Complete conversion of those routes, rather than a gradual

system-wide dieselization, has been planned both because of their heavy traffic load, and for economy in the installation of necessary service and maintenance facilities.

In anticipation of early conversion of the Haydarpasa-Ankara line, installation of the required diesel servicing facilities has already been largely completed. Work was started during 1960 on a large diesel heavy repair and maintenance shop at Guvercin, 8 kilometers west of Ankara. The first stage of the Guvercin shop construction, costing almost 15,500,000 TL ($1,722,000) and including grading and foundations, several railway and highway bridges, storm drainage, and other preparatory work, is now over 50 per cent complete. Estimated cost for the remainder of the project is 300 million TL ($33,330,000), with the construction schedule dependent upon the availability of funds.

Five US-built, 1980/1800 hp, C-C, diesel-electric locomotives, delivered early in 1958 by the General Electric Company, have provided the only Turkish experience to date in the application of diesel traction to heavy main line services. The five units are regularly assigned to the overnight Haydarpasa-Ankara "Anatolia Express" and to the run of the Haydarpasa-Baghdad "Taurus Express" between Ankara and Adana, a distance of 678 km. In their first three years of service the GE locomotives have been averaging from 15,000 to 16,000 km monthly. Highly satisfied with the performance of the US diesel-electrics, Turkish motive power officers would probably specify them for their main line dieselization even without the "US procurement only" restriction attached to most DLF loans.

Aside from the five GE units, TCDD diesel motive power experience has been confined entirely to diesel-hydraulic railcar units and relatively light diesel-hydraulic shunters. The railcars are employed in a variety of local services and on fast daytime schedules between major cities. Among the latter are such important trains as the Istanbul-Ankara "Bogazici" ("Bosphorus"), the Izmir-Ankara "Ege" ("Aegean"), and the Ankara-Adana "Cukurova". These principal daytime motor train services are operated by German-built (MAN) three-car trainsets powered by two 550-hp MAN diesels and fitted with Voith hydraulic transmissions. Second class accommodations only are provided and the trains are equipped for dining and beverage service. Most of the railcars operated in local or medium range express services are provided with both second and third class accommodations.

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Les Chemins de Fer Turcs Entament Dieselisation à Grande Echelle

L'emprunt récent de $10 millions aux Chemins de Fer de l'État Turcs (TCDD) du Development Loan Fund Américain a déblayé la voie pour la première phase de la conversion du réseau principal de force motrice vapeur en diesel. L'emprunt prévoit la fourniture de 32 locomotives par les États-Unis et l'outillage d'un atelier d'entretien diesel en voie de construction près d'Ankara. Les 32 locomotives, qui seront probablement du type diesel-électrique 1980/1800 CV, C-C, seront mises en service sur la ligne principale Istanbul-Ankara de 576 km. Des fonctionnaires de la TCDD estiment que 62 locomotives seront nécessaires pour la dieselisation complète de la ligne. On prévoit en outre la reconversion de la ligne d'Ankara à Zonguldak, port à la Mer Noire, longue de 485 km, servant au transport du charbon et des minerais à l'unique aciérie turque à Karabuk, ainsi que le transport du charbon des mines de Zonguldak. La reconversion complète de ces lignes, plutôt que la dieselisation graduelle du réseau entier, a été projetée, à cause de leur trafic intense, ainsi que par des raison d'économie dans l'aménagement des installations de service et d'entretien.

Türkische Staatsbahn beginnt mit grossem Verdieselungsprogramm

Mit der Gewährung einer zehn Millionen Dollaranleihe hat die USA Entwicklungshilfe der türkischen Staatsbahn (TCDD) den Weg für das erste Umstellungsstadium der Hauptstrecken vom Dampf- auf Dieselbetrieb geebnet. Das Geld ist für den Ankauf von 32 Lokomotiven in den Vereinigten Staaten bestimmt und für die Ausrüstung einer neuen Diesel-Wartungswerkstatt, die zur Zeit bei Ankara gebaut wird. Die 32 Loks, wahrscheinlich mit C-C dieselelektrischen Antrieben von 1980/1800 PS, sind für den Einsatz auf der 576 km langen Hauptstrecke Istanbul–Ankara. Die türkische Eisenbahndirektion hat für die vollständige Verdieselung der Strecke insgesamt 72 Einheiten vorgesehen. Das nächste Umstellungsprogramm betrifft die 485 km lange Strecke von Ankara nach dem Schwarzen Meer Hafen Zonguldak für den Schwergut-verkehr von Kohle und Erzen nach der einzigen Stahlfabrik der Türkei, Karabuk, sowie für den Kohlentransport aus dem Bergwerk bei Zonguldak. Wegen des frequenten Güterverkehrs und aus wirtschaftlichen Gründen hinsichtlich der Installation notwendiger Dienste und Wartungsanlagen, wurde eine vollständige Umstellung dieser Strecken einer allmählichen Verdieselung des gesamten Bahnnetzes vorgezogen.

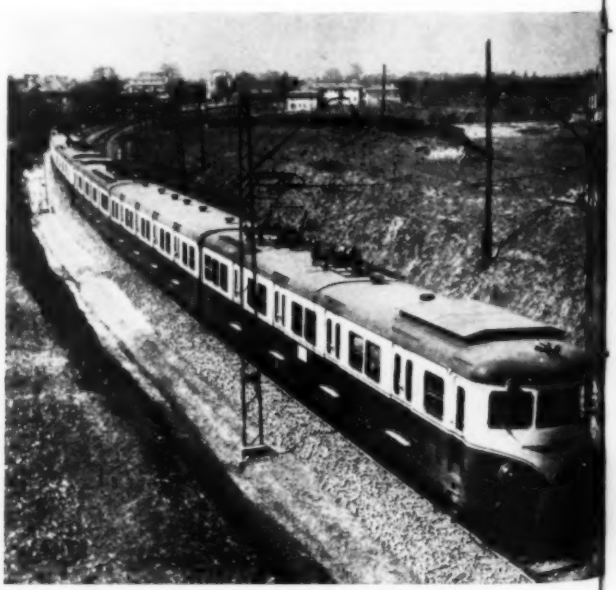
Dieselización en gran escala de los Ferrocarriles turcos

El préstamo de 10 miliones de US$ a los Ferrocarriles del Estado turcos (TCDD) del US Development Fund ha inaugurado la primera fase de la dieselización de las líneas principales. El préstamo hará posible la compra de 32 locomotoras en los EEUU y del equipo para un nuevo taller de mantenimiento que se está construyendo en Ankara. Los 32 locomotoras, probablemente de 1980/1800 CV, C-C, tipo dieseleléctrico, servirán en la línea principal Istanbul–Ankara de 576 km. Funcionarios de los TCDD estiman que 62 unidades en total bastarán para la dieselización completa de la línea. Se planea también la dieselización de la línea que une Ankara al mar Negro (Zonguldak), 485 km., la que transporta carbón de piedra y minerales a la única acería de Turquía en Karabuk. La conversión completa de estas rutas es preferible a la dieselización gradual del sistema a causa del tráfico pesado y para economizar en la instalación del equipo de servicio y mantenimiento.

Three-car diesel-hydraulic trainset passes local freight near Izmit. At right a new diesel-electric heads-up the fast Anatolia Express.
Rame diesel-hydraulique à trois voitures passe marchandises local près d'Izmit. À droite un diesel-électrique rattrape l'Anatolia Express.
Dreiteilige dieselhydraulische Triebzüge für Güternahverkehr nach Izmit. Rechts: Anatolia-Express mit neuem dieselelektrischem Antrieb.
Rama diesel-hidráulica de 3 coches para tren de carga. A la derecha nuevo tren diesel-eléctrico alcanza el Expreso Anatolia.

Although all of the motor trains now in service on the Turkish railways are of either German manufacture, or are built in France and equipped with German engines, the newest units being added to the TCDD railcar fleet are built by Fiat of Italy, which is now delivering 15 three-car diesel-hydraulic trainsets. Each trainset is powered by four 145-hp, Fiat 203 series diesel engines, two of them mounted under the floor of each end unit. Each engine is connected to a separate power truck by a cardan shaft drive. One axle only is driven on each power truck. Top speed of the trainsets is in the vicinity of 90-100 km/h. Accommodating a total of about 200 second and third class passengers each, the new trains will be employed in such medium range services as the 342-km route between Izmir and Bandirma, and the 318-km run between Istanbul and Edirne.

Diesel-hydraulic shunting locomotives are already in wide use at principal TCDD terminals. The units now in service are either 360-hp 0-6-0 or 800-hp 0-8-0 locomotives, equipped with side rod drive. The majority of them were manufactured by MaK of Germany. The newest shunting locomotives, however, employ a cardan shaft drive. These are 13 650-hp units just delivered by Esslingen and Krupp.



At left, a German-built MAN trainset, powered by two 550-hp diesels. At right, electrification competes with diesels in suburban service.
À gauche, rame MAN allemand, à deux moteurs diesel de 550 CV. À droite, l'électrification fait la concurrence aux diesels en service de banlieue.
Links: Wagenzug von M.A.N.-Nürnberg mit zwei 550 PS-Dieselantrieben. Rechts: Elektrifizierung wetteifert mit Dieselbetrieb im Nahverkehr.
A la izq. rama MAN accionada por dos automotores diesel de 550 CV. A la der. la electrificación rivaliza con diesel en servicios de carcanías.

Alsthom Extends Monomotor Principle

The Alsthom Company, originators of the traction motor and bogie assembly with a variable gear ratio, are developing this design further. Already a CC prototype electric locomotive has been completed and diesel locomotives embodying the same type of assembly are under construction.

The first locomotives with "Monomoteur" bogies were the BB 25 kv AC 50-cycle 16500 series for the Paris-Lille line. The 16500 embodies a single DC traction motor mounted on each bogie with a variable gear ratio which enables them to be employed in either passenger or freight service.

The gear ratio change-over is carried out by moving a lever when the locomotive is at rest. The higher ratio gives the locomotive a maximum speed of 140 km/h and the lower ratio a maximum speed of 58 km/h. The maximum tractive effort is 19 and 32 metric tons respectively.

The prototype CC electric locomotive —CC 10002—is similar to the 16500 in many respects. Electrical layout is the same, while the body-frame is virtually a lengthened version of the BB type. The three-axle bogies are in the nature of mobile test beds to provide additional data on the monomotor design. The application of a single high power (1800 hp) traction motor on a three-axle bogie offers maximum efficiency with minimum weight. The added advantage of dual ratio gearing provides extreme flexibility in operation. The axle load is only 16 metric tons. Other points in favor of the

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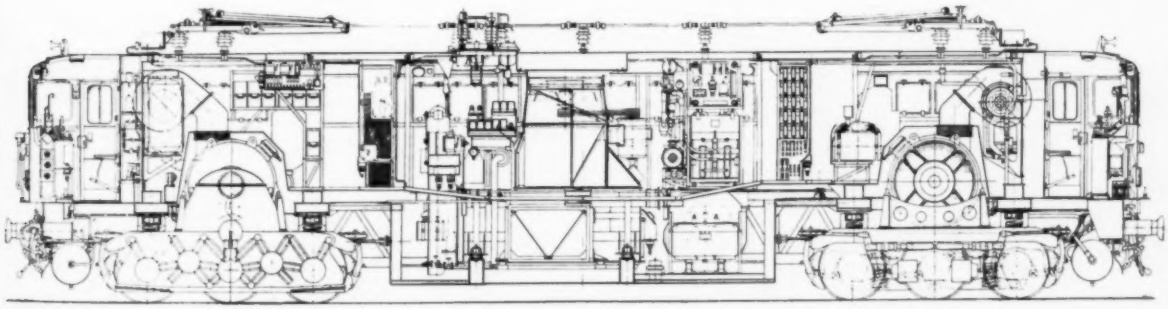
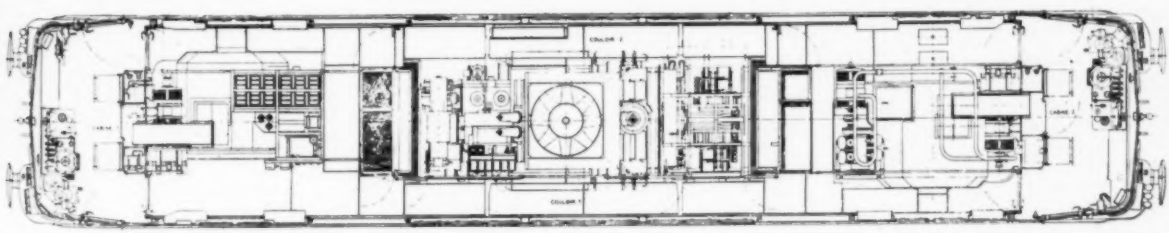




design are the high degree of adhesion and reasonable construction cost.

The bogie uses many of the components found in the two-axle 16500-type bogie. The motor is spring-borne, the axles being driven via the variable ratio gearbox through Alsthom floating rings. This insures self-equalizing coupling of the suspension fluctuations between gearbox and driving wheels which is practically homokinetic and without play or lubrication. The main drive from the gearbox is to a crown wheel which meshes with a pinion on the center axle. Other pinions are in mesh with gear wheels on the outer axles. All inter-axle gearing is mounted on the outside of the carrying wheels with bogie frames and bearings on the inside. The coupling between the traction motor and the variable gear ratio equipment is flexible.

Alsthom is now going ahead with the applications of the monomotor bogie for use in conjunction with diesel-powered locomotives. The initial design will be a CC type with an output of 2800 hp and a weight of 90 metric tons. The bogies will be similar to those employed on the prototype CC 10002 electric. Some 18 of these diesel-electrics have been ordered by the Finnish State Railways, the first being due for completion in April 1962.

Other designs which could use the monomotor bogies and for which Alsthom has prepared suitable plans are 4000/4800-hp and 2600/3200-hp diesels and 3500-hp 50-cycle electric and 4200-hp multi-frequency electric units. They envisage the 4000/4800-hp diesel as weighing 96 metric tons and having two diesel engines while the 2600/3200 type would have a single diesel engine which would either be coupled to a DC generator or have an alternator and silicon rectifiers. Train heating equipment, if required, could be either a steam heat boiler or an alternator for electric train heating.

The 3500-hp AC electric would weigh 81 metric tons and employ mechanical equipment similar to the diesel design and electrical parts of the same type as those used on the 16500 series. The last design study covers a 4200-hp 87-metric ton locomotive capable of operation on either 1500 volts or 3000 volts DC or 16,000 volts or 25,000 volts AC. Such a unit would be admirably suited to the operation of international trains. All these examples would be of the CC type and be identical in general dimensions—the overall length, for example, being 17.3 meters and the distance between bogie centers 11.4 meters in all cases.

Alsthom is also building for the Spanish National Railways a 1500/3000-volt DC dual voltage locomotive which is a BB type with monomotor bogies. This design will weigh 80 metric tons.

Nouvelle Conception de Bogie

La compagnie Alsthom créatrice de l'ensemble moteur traction et bogie à rapport d'engrenage variable, développe ce système. Déjà un prototype CC d'une locomotive électrique a été complété et des locomotives diesel du même type sont en voie de construction.

Neues Drehgestell

Die Alsthom-Werke, erste Hersteller der Triebmotor-Drehgestelleinheit mit veränderlichem Übersetzungsverhältnis, entwickeln dieses Aggregat weiter. Die CC-Prototype einer Ellok wurde bereits fertiggestellt; der Bau von Diesellokomotiven mit derselben Einheit wurde in Angriff genommen.

Nuevo Diseño de Bogie

La Compañía Alsthom está diseñando otros más desarrollos de su conjunto motor tracción y bogie con relación de engranaje variable. El prototipo de una locomotora eléctrica CC ya ha sido completado y se están construyendo locomotoras diesel que incorporan conjuntos del mismo tipo.

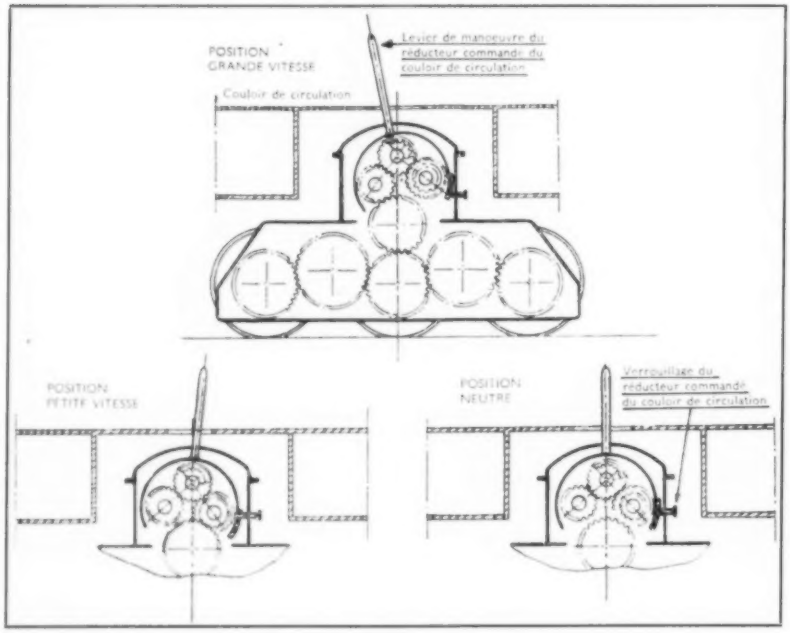

POSITION GRANDE VITESSE
Couloir de circulation
Levier de manoeuvre du réducteur commande du couloir de circulation
POSITION PETITE VITESSE
POSITION NEUTRE
Verrouillage du réducteur commande du couloir de circulation

Diagram showing double reduction transmission of C. Alsthom bogie.

Schéma de principe de la transmission à bi-réduction du bogie C. Alsthom.

Alsthom: Prinzipzeichnung der doppelt untersetzten Transmission des Drehgestells.

Diagrama del principio de la transmisión del bireductor a engranajes del bogie C. Alsthom.

Foreground—main brush and spray groups; left rear—sprays for acid solution; right rear—sprays for detergent for regular daily cleaning. Trains normally come via right-hand detergent group, then through main group.

Avant-plan — groupes principales d'arrosage et de brossage; arrière gauche — arrosage solution acide; arrière droite — arrosage dégraissage, nettoyage journalier. Les trains viennent de droite vers l'avant-plan.

Im Vordergrund: Hauptwaschanlage; links hinten: Sprüher für Säurelösung; rechts hinten: Sprüher mit Reinigungsmittel für das tägliche Waschen. Normal kommen die Züge von rechts zum Reinigungsmittelsprüher, danach zur Waschanlage.

Parte anterior — juegos de escobillas y pistolas; fondo (izquierda) — pistolas para solución ácida; fondo (derecha) — pistolas para la limpieza diaria. Los trenes pasan el juego de la derecha, luego el juego principal.

Cleaner Cars For British Rails

German passenger car washing equipment has been installed at two depots on British Railways and is to be the standard design throughout the North Eastern Region. The installations provide a higher standard of cleanliness and considerable economies have been achieved from their automatic operation.

The two new car washing plants are at South Gosforth and Heaton, both in the Newcastle area, on the NE Region of British Railways. The cleansing action consists of a series of high speed rotating nylon bristle brushes mounted on upright spindles in conjunction with the application of sprays of water and a cleansing agent. The spindles are mounted on swing arms and the brushes are held against the bodysides of the cars by pneumatic pressure.

Compressed air is supplied to a cylinder in the brush pedestal and is governed by solenoid-operated valves.

Brushes and sprays are arranged in three groups on either side of a track leading to the car sheds. Cars undergoing cleaning pass these three groups, which are as follows:

1. Arched spray for preliminary wetting and a pair of brushes and sprays applying the detergent solution.
2. Three pairs of brushes rotating in alternate directions, followed by a high pressure water spray and, finally, a water mist window spray to eliminate streaks.
3. The third group is for special periodic cleaning in which a mild acid solution is applied, followed by the normal washing process.

Both the detergent and the final washing groups are automatically operated by the trains themselves by photo-electric cells.

Individual electric motors drive the spindles at 600 rpm. Apart from the direct high-pressure jets each pair of brushes is watered by its own spray. Water consumption of the washing machine operating in conjunction with either detergent or acid solution is 772 liters per minute. To relieve the demand on the mains, water is collected from concrete aprons and filtered through a sump. Reclaimed supplies represent over half the total amount needed, mains water being used only in the final washing-off operation.

Water pressure is maintained by electrically driven pumps located in a separate pump house. The latter also contains an illuminated control panel governing the operation of the plant. Additional controls are provided for adjusting the strength of detergent and acid solutions. Normal solutions used are one per cent Teepol for regular detergent cleansing, and five per cent Exmover for periodic cleansing.

At South Gosforth the plant is washing about 200 electric and diesel multiple-unit cars daily and giving special periodic cleaning to 20 vehicles. The Heaton plant is dealing with a similar number of locomotive-hauled cars. The NE Region say that the positive scrubbing action on the cars is much more effective than the mild rubbing of rotating cloth flails used in earlier installations.

The new plants were supplied and installed by Kullens & Co. of Reutlingen, West Germany, under the direction of the Chief Mechanical and Electrical Engineer and Chief Civil Engineer, NE Region, BR.

British Railways Installent Nouvel Outillage de Lavage

Le nouvel outillage allemand de lavage de voitures, récemment installé à South Gosforth et Heaton, deviendra probablement standard dans la région nord-est des British Railways. Les nouvelles installations permettent une plus grande propreté du matériel roulant et constituent une économie par suite de leur fonctionnement automatique.

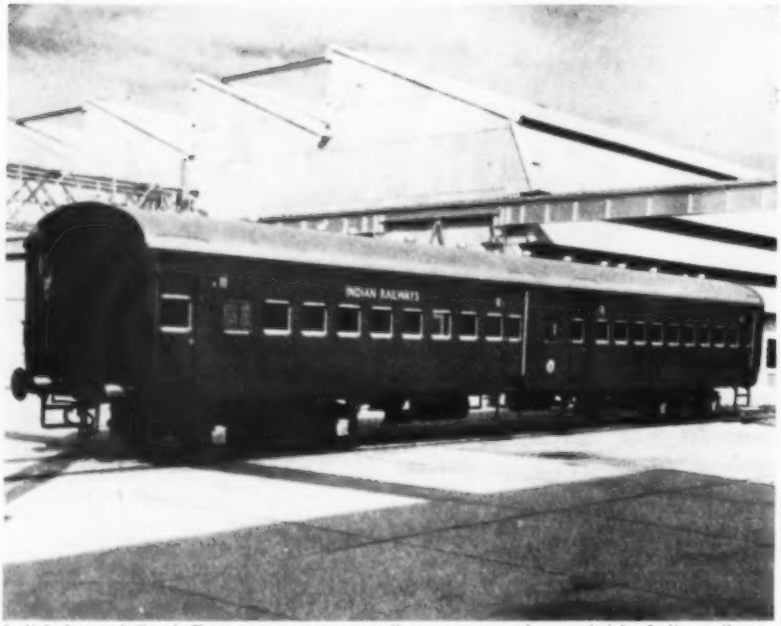
Neue Waschanlage der British Railways

Eine deutsche Personenwagen-Waschanlage, kürzlich bei South Gosforth und Heaton in Betrieb gestellt, ist als Norm des Nordost-Bezirkes der British Railways ausersehen. Man sagt, dass die neuen Anlagen eine höhere Sauberkeitsnorm des Rollmaterials erwirken und wegen ihres automatischen Betriebes wirtschaftlicher im Gebrauch sind.

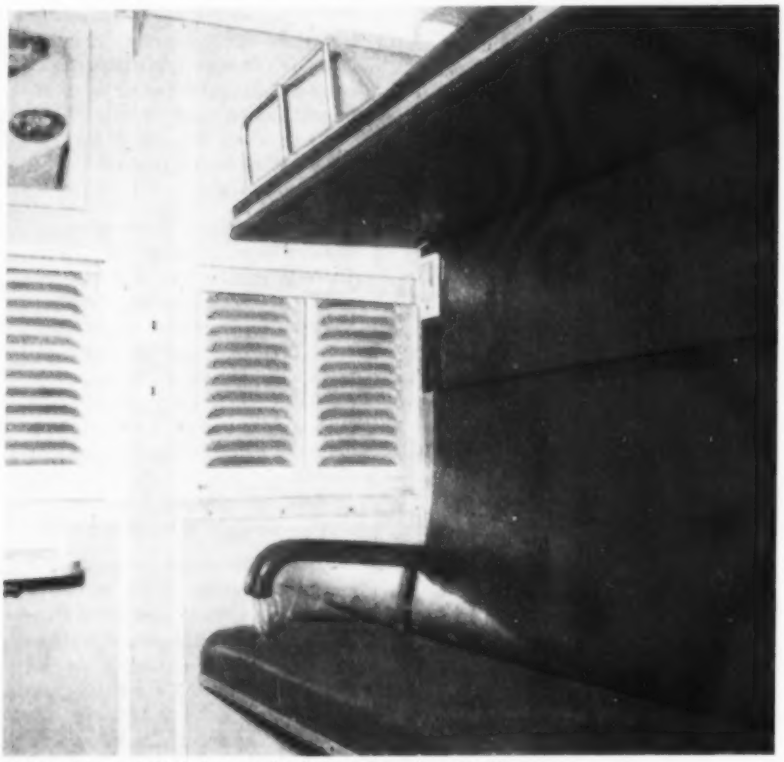
Los FC británicos instalan nuevo equipo para la limpieza

Equipo para lavar coches de procedencia alemana, el que acaba de instalarse en South Gosford y Heaton, será introducido generalmente en la North Eastern Region de los British Railways. Se dice que las nuevas instalaciones facilitan una limpieza mayor del material rodante y que son económicas en el uso por causa de su operación automática.

India Builds Its Own Coaches



India's Integral Coach Factory now turns out all passenger coaches needed by Indian railways.
L'Usine Integral Coach de l'Inde fournit maintenant toutes les voitures requises par l'Inde.
Indiens Integral Coach Factory liefert alle Reisewagen, die die indische Eisenbahn benötigt.
La Integral Coach Factory de India produce coches para los Ferrocarriles indios.



Light weight steel third class coaches built at Perambur seat 80.
Voitures de troisième classe, acier léger, construites à Perambur, 80 sièges.
Leichtmetallwagen, dritte Klasse, aus Perambur; 80 Sitze.
Coches ligeros de acero de 80 asientos, construidos en Perambur.

Indian railways now get their passenger cars at home.

That they can do so is a result of the government's decision to make Indian railways self-sufficient in the matter of passenger coaches by establishing a separate factory for their construction. The decision, in turn, was a result of "unprecedented increases" in passenger traffic during and after World War II, plus the obsolescence of existing cars and inadequate capacity for building new ones.

India's Integral Coach Factory, at Perambur, near Madras, was set up under the country's first Five-Year Plan, with the technical collaboration of the Swiss Car & Elevator Manufacturing Corporation, Ltd., of Switzerland.

Construction of the factory was begun in February 1952; the first machine was installed 22 January 1955; and car production was inaugurated 2 October 1955. The initial capital outlay authorized for the Shell (car body) Factory was Rs. 7.35 crores (more than $15,000,000 US) with an additional Rs. 3.69 crores (about $7,500,00 US) authorized during the Second Five-Year Plan for a Furnishing Annex. As it now stands, the factory, including the annex and the adjoining residential townsite for employees, covers about 500 acres (200 hectares). It employs more than 7,000 people in plant, offices and designing room.

The Shell Factory alone consists of 10 different shops, the largest of which is 304.7 m long by 79.2 m wide. Production facilities include a sheet metal shop; a door and window assembly line; galvanizing and electro-plating equipment; six assembly lines for car bodies and two for bogies; and a paint shop. Equipment includes more than 1,000 items of machinery for manufacture of components and assembly of cars. Present production is about 55 cars per month.

Coach Design

Integral coaches produced in the factory are of modern, lightweight, all-welded steel construction, designed for maximum passenger comfort and safety.

They are about seven tons lighter than conventional coaches of 42 tons, which means more cars—and more passengers—per train.

The design incorporates an all-welded trough floor, integral with the body, which allows forces sustained by the car to be

borne by the entire car shell, including the skin. Car ends are of the anti-telescoping type, so that, while the ends themselves may buckle in the event of accident, they absorb most of the collision energy and thus reduce the risk of injury to passengers.

The body shell, after assembly, is designed to withstand a vertical load of 45 tons uniformly distributed along the whole floor and, simultaneously, a horizontal compression load of 100 tons on each buffer; a horizontal compression load of 60 tons at 1 foot (30.48 cm) above the center line of the buffers over the whole width of the coach, and a horizontal compression load of 30 tons uniformly distributed over the whole body end.

Specially designed bogies, based on the Schlieren design, incorporate several new features, including roller-bearing axle boxes. The latest type of bogie has all coil springs for both primary and secondary suspensions, plus shock absorbers and side bearers to provide good riding and smooth running.

Coach interiors are sprayed with limpet asbestos to provide insulation against both heat and sound. Light alloy windows are fitted with balancing devices for shutters.

Interior design, like over-all construction, is planned to afford maximum passenger comfort. Unlike third-class cars of earlier designs, the integral coaches are split up into eight compartments, each seating 10 passengers. Each compartment is equipped with two fans, and is adequately lighted for night travel. Two sets of luggage racks in each compartment, plus others on the corridor side, are intended to keep floors and seats free.

Seats and back rests were originally well curved to provide comfort for long-distance passengers, but are now being made flat, and wider, so passengers have more room to spread bedding or otherwise make themselves comfortable. Lavatories have all essential amenities, such as wash basins, mirrors and towel racks.

Car Production

Under the Technical Aid Agreement with the Swiss collaborators, the Integral Coach Factory was scheduled to achieve its planned maximum output of 350 car shells per year, in progressive stages, in the fifth year after the start of production, that is, in autumn, 1960. This schedule has been exceeded by a wide margin; the thousandth coach was turned out early in 1960, far ahead of the planned date. Performance has improved steadily, and each year's output has exceeded that of

CONTINUED

L'Inde construit ses propres voitures

En cinq années l'Integral Coach Factory de l'Inde a atteint une production suffisante à satisfaire à toute demande en voitures des chemins de fer de l'Inde. En outre une augmentation en efficience, l'introduction d'une seconde équipe et la fondation d'un atelier de garnissage de voitures augmenteront la production les cinq prochaines années jusqu'au point où l'usine sera à même de faire la concurrence à d'anciennes maisons pour la fourniture de voitures à d'autres pays. Pour l'Inde même, le but de l'usine est de fournir à un prix raisonnable une voiture assurant la sécurité et le confort, surtout pour la troisième classe, ces voyageurs constituant la majorité du transport des voyageurs sur le réseau indien. L'usine est toutefois à même de fournir des voitures de première, des wagon-lits et des rames de banlieu. Jusqu'à présent l'usine a fourni près de 1,500 voitures et projette une production de deux fois et demie ce chiffre dans les cinq années à venir. Cette usine, près de Madras, fut fondée conformément au premier Plan Quinquennal du pays, avec la collaboration de la Car & Elevator Manufacturing Corporation, Ltd. suisse. Le département carrosserie seul comprend 10 ateliers différents, dont le plus grand mesure 1,000 sur 260 pieds.

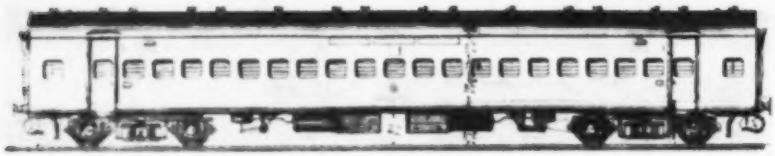
Indien baut seine eigenen Personenwagen

Nach gut fünf Jahren deckt die Produktionsleistung Indiens Integral Coach Factory bereits den Bedarf der indischen Eisenbahn an Reisewagen. Weitere Nutzung der Leistungsfähigkeit, Einführung einer zweiten Arbeitsschicht und ein eigener Wageneinrichtungsbetrieb wird die Produktion in den nächsten fünf Jahren derart erhöhen, dass die Fabrik, im Wettbewerb mit älteren Unternehmen, anderen Ländern Wagenlieferungen anbieten kann. Für Indien selbst hat die Fabrik den Zweck, vor allem den Passagieren der dritten Klasse, die Mehrheit aller indischen Eisenbahnreisenden, zu angemessenen Kosten stabile und komfortabele Reisewagen zu verschaffen; sie ist aber auch darauf eingestellt, Schlaf- und erste Klassewagen sowie Material für den Nahverkehr zu fertigen. Bis heute wurden ungefähr 1500 Wagen hergestellt; für die nächsten fünf Jahre umfasst das Herstellungsprogramm das Zweieinhalbfache.

Die Integral Coach Factory in Perambur bei Madras wurde innert des ersten fünfjahresplanes des Landes, in technischer Zusammenarbeit mit der Swiss Car & Elevator Manufacturing Corporation, Ltd., Schweiz, gebaut. Die Karosseriefabrik besteht aus zehn Hallen, deren grösste 304.80 m lang und 79.25 m breit ist.

India construye sus propios coches

En un período de unos cinco años la Integral Coach Factory de India ha alcanzado un nivel de producción que basta para la demanda entera de coches de los ferrocarriles de India. Mayor eficacia, la añadidura de una segunda tanda y la terminación de una tapicería de coches aumentarán la producción en los cinco años que vienen hasta el punto de que la casa ya hace competencia a fabricantes más viejos en otros países. Para India el objeto es producir de manera ecónomica un coche seguro y confortable, sobre todo para los pasajeros de tercera clase que constituyen la mayor parte de los viajeros. Sin embargo puede producir también coches de primera clase, coches cama y unidades de cercanías. Ha construído hoy casi 1.500 coches y en los cinco años que vienen tiene que producir dos veces y media tanto. Se ha establecido la Integral Coach Factory en Perambur bajo el primer plan quinquenal, con la asistencia técnica de la Swiss Car & Elevator Manufacturing Corporation Ltd. La fábrica de cajas consiste de 10 talleres diferentes; uno de ellos tiene una largura de 1000 pies y una anchura de 360 pies.



INDIA BUILDS ITS OWN COACHES

CONTINUED

the preceding year, as the accompanying chart shows.

As employees have gained in experience and skill, efficiency has improved along with production; costs and man-hours spent on each car body have been correspondingly reduced. Initially, it took about 19,600 man-hours and cost about Rs. 186,000 to produce a coach shell. Currently, the corresponding figures are about 8,600 man-hours and Rs. 80,000, including overhead and depreciation. This is substantially lower than the landed cost, in India, of foreign-built cars. Further increases in efficiency are expected as a result of an incentive payment system inaugurated in January 1960.

The original idea was that the ICF would produce only a standard coach shell, which could be fitted out for any class or type of service. Its primary emphasis is still on provision of a safe, comfortable car for the third-class passengers who constitute the great majority of travelers on Indian railways. It has, however, been geared up also to produce other types of cars as India's increasing industrialization and rising standards of living lead to demands for still more comfortable vehicles. It also plans to build meter-gauge and electric multiple-unit cars.

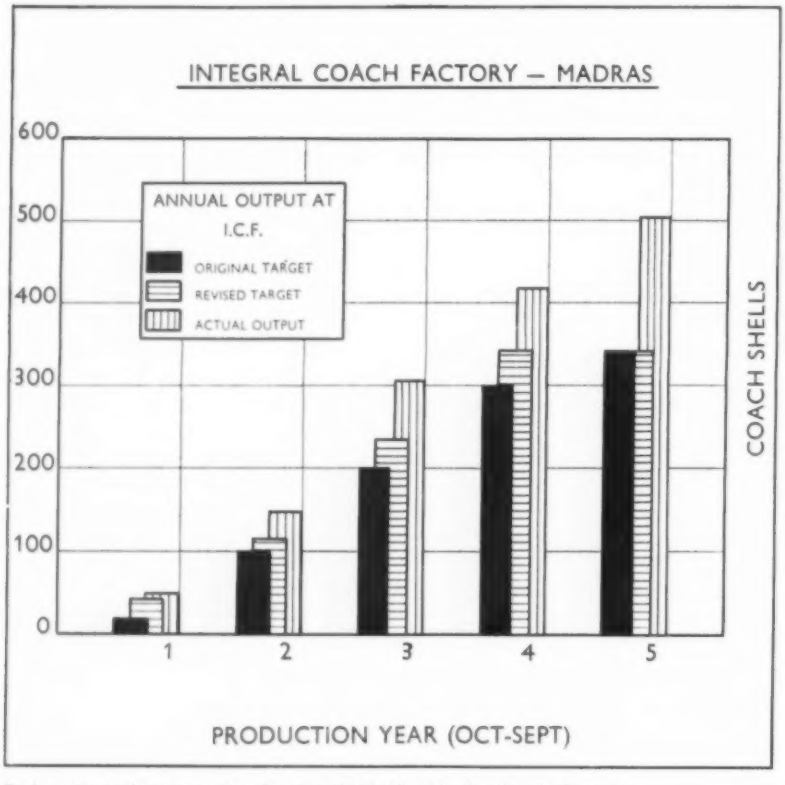
Total production schedule up to the end of the Second Five-Year Plan (March 1961) called for output of 1,433 cars and a start on production of 340 others. The completed cars were to include 1,047 integral third-class coaches (Type "T"); 150 integral third-class sleeping cars (Type "TCN"); 121 integral combination passenger-baggage cars (Type "TLR"); and 115 conventional "T" type third-class coaches. The cars slated to be under production, but not completed, in March, were to include 185 conventional "TLR" passenger-baggage cars and 155 integral first-class coaches (Type "F").

The output of the temporary Furnishing Unit—now being replaced by a permanent unit—has been gradually increased to about 25 finished cars per month, that is, about half the monthly production of the shell unit. Up to March 1961 it was scheduled to furnish, complete, 474 "T"-type third-class coaches; 150 "TCN" third-class sleepers; 61 "TLR" third-class combination cars; and 25 "F"-type first-class coaches.

Encouraged by the excellent performance during the Second Plan period, the Integral Coach Factory has now embarked on a still more ambitious program to produce 3,735 cars during the Third Five-Year Plan, which runs from April 1961 to March 1966.

Within that period the factory is scheduled to deliver 1,991 broad-gauge cars, including 23 third-class coaches; 235 passenger-baggage cars; 462 first-class coaches; 592 combination first and third-class units; 67 rail cars, and 612 trailers for use with multiple-unit power cars on electrified lines. Production for meter-gauge lines will total 1,734 units, including 1,198 third-class coaches; 73 motor cars; 343 motor-baggage cars, and 120 rail cars. Ten rail cars for narrow-gauge service are also scheduled.

The Third Five-Year Plan further envisages completion of the Permanent Furnishing Unit, which eventually will be able to complete on a standardized basis, and make available to the railways, without loss of time, all cars turned out by the Shell Factory.



Each year's production, to date, has exceeded both original and revised targets.
Chaque production annuelle dépasse jusqu'à présent les buts originaux et revisés.
Jede Jahresproduktion hat bis heute sowohl die erste wie die erhöhte Zielsetzung überschritten.
Hasta ahora la producción anual ha sido siempre más de la del programa.

Export Activities

Having achieved sufficient production capacity to meet all passenger-car needs of its own Indian railways, the Integral Coach Factory is now investigating the possibility of supplying coaches to other countries. Already, in fact, it has submitted bids on cars for Pakistan and Argentina. In Pakistan, ICF's bid was the lowest of all those received from seven countries. In Argentina, it submitted the second lowest of 28 tenders from 15 countries.

The contemplated increase in production, whether for Indian domestic or foreign use, are expected to require addition of a full second shift to the working force, and construction of additional housing quarters for employees.

Périssables Dépôt Britannique

Pour faire face aux importations grandissantes de fruits et de légumes venant par rail des pays de la Méditerranée, les British Railways ont ouvert un nouveau dépôt de réception de £1,500,000 à Hither Green, cequi réduit de 24 heures le transport des produits aux détaillants.

Lager für verderbliche Waren

Zur Bewältigung des wachsenden Imports der bahnversandten Früchte und Gemüse aus den Mittelmeerländern, hat die British Railways ein neues Auffang-Depot für £1,500,000 bei Hither Green eröffnet. Hierdurch wird die Lieferzeit vom Zug zum Kleinhändler mit 24 Stunden verkürzt.

Almacén para perecederos

Con el objeto de poder transportar las importaciones crecientes de frutas y verduras de la región mediterránea, los ferrocarriles británicos han inaugurado un nuevo almacén en Hither Green, coste £1,500,000, el que reduce en 24 horas el tiempo que se necesita para transportar los géneros de los trenes a los detallistas.

Train from Dover approaches new depot (above); is unloaded inside (below).
Le train de Douvres au nouveau dépôt (ci-dessus); déchargement (ci-dessous).
Der Zug von Dover fährt zum neuen Depot (oben); Innenansicht (unten).
Un tren de Dover llega al nuevo almacén (arriba); se descarga en el interior.

How Britain Handles Perishables

Since the end of World War II imports of fruit and vegetables into Britain from the Continent have been growing. Rail-borne traffic of this kind comes from the Mediterranean countries and crosses the English Channel via the Dover-Dunkerque train ferry service. Until recently trains of perishables went to the Southern Region's Continental depot at Southwark in south-east London. Out of date and too small, the Southwark depot was unable to cope with the traffic, which has resulted in diversions. Also, it was located in an area liable to road traffic congestion.

As a result, a completely new depot has been built and opened at Hither Green at a cost of £1.5 million. Farther from central London, it is clear of the worst of London's road traffic congestion and adjoins one of the principal classification yards of the Region.

Principal features of this new center are:

• Adequate space is provided for importers and wholesalers to transfer loads from rail to truck for delivery.

• Loaded cars for other than the London area can be cleared through customs and then switched into the adjoining classification yard.

• The first floor consists of rental warehouse space which will earn revenue.

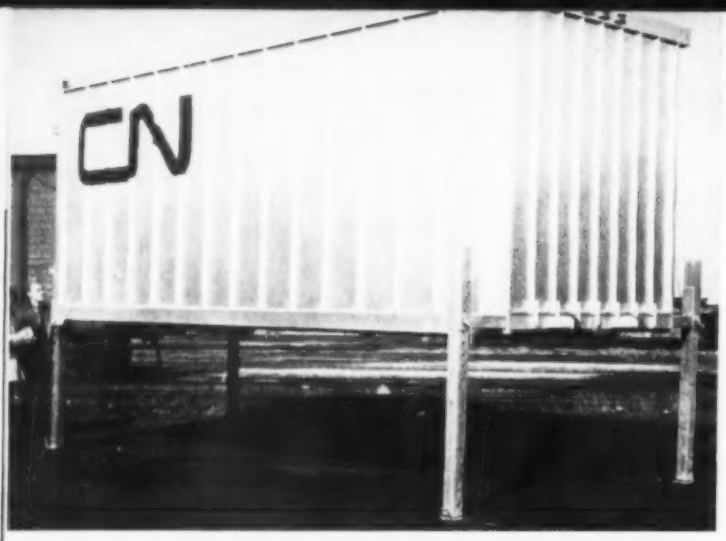
• Provision of warehouse space will speed unloading of cars and be cheaper for the trader than paying demurrage.

The depot is capable of handling even the biggest seasonal rush—up to 200,000 tons of perishables a year. There are two tracks running into the depot. One track allows unloading direct into waiting trucks which use a 21.3-m-wide roadway running the length of the shed. The second track serves an unloading dock, 15.2 meters wide, from which trucks can also be loaded. Fork lift trucks and gravity roller conveyors speed the unloading operation. Each track has a capacity of 26 Continental freight cars.

Serving the warehouse space on the floor above are four large elevators. To keep the inside of the building at an even temperature there are 57 fans. The building also has offices for the importing agents and customs officers.

Four trains a day on the average come from the ferry terminal at Dover. The depot receives advice on the size of the train and the number of full car loads and mixed consignments by Telex. The route from Dover is electrified (third rail, 750-volts DC) and trains are usually hauled by 2,500-hp BB locomotives. Within the yard area and in the depot, current is picked up from an overhead line by pantograph.

The Hither Green depot enables up to 24 hours to be cut off the time it takes to get produce into the shops. During the first two weeks it was open it handled twice as much as was moved through Southwark during the same period in the previous year.



Canada Tests New Railway-Highway Container System

A new rail-highway container system has reached the testing stage in Canada.

Developed by Steadman Industries, Ltd., Toronto, this new system consists of three elements: containers in 6.09 m multiples; a "see-saw" rocker beam that can be mounted on a standard truck chassis in minutes, and a turntable device for use on flat cars. Cars may be equipped with two or three turntables, depending on car length.

Containers are side-loaded for rail movement, and, once in position, are locked to the car frame. A steel plate is used to reinforce the container door area, making the boxes almost pilferproof.

W. J. Steadman, designer of the system, says his firm's approach to containerization will expedite interchange between carriers. The present containers can be handled by highway or railroad, and while exact figures have not been revealed, the Steadco system is said to cost much less than anything presently available.

Mr. Steadman reports that sales organizations are now being set up in both Canada and the US.

The designer describes a typical rail-highway operation of the system as follows:

The truck is backed into position at right angle to the flat car. The power take-off is used to activate the rocker beam mounted on the truck chassis. Small hydraulic cylinders power the up-and-down see-saw motion of the beam. Thus the rocker can tilt the rear of a container higher or lower to aline it with the turntable located in the car floor. Guide rails on the turntable aid in centering the container for loading.

Once the container unit is alined and centered it is hydraulically pushed onto the turntable and locked. This pushing action—or pulling, in the case of unloading—is provided by a short metal arm, powered by another hydraulic cylinder. The cylinder is mounted horizontally on the truck chassis, independent of the rocker beam. The ram, with 50.8 cm travel, engages a channel in the floor of the container. By simply reversing the ram head, the device will either push or pull. In short, it operates similar to a conventional automobile jack.

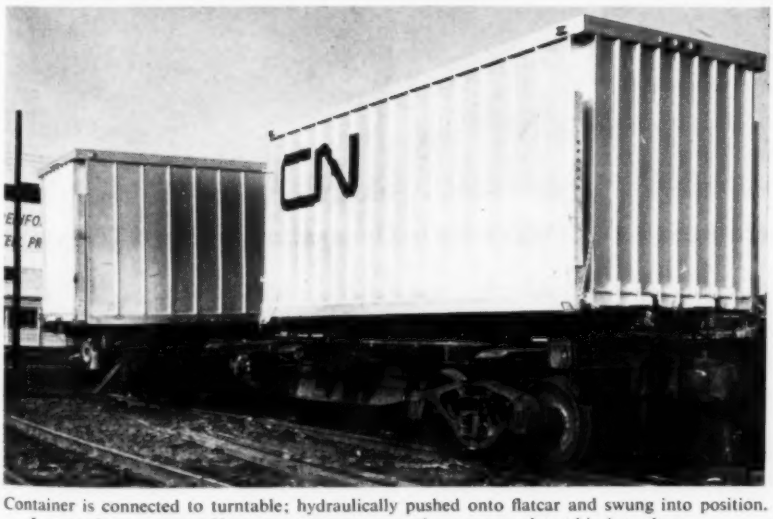
When the container is on the flat car, it is swung lengthwise and locked in place. According to Mr. Steadman, the entire loading operation can be completed in less than five minutes. Unloading, with the loading procedure reversed, can be handled in equal time. The units are being tested by a trucking firm.

The Steadman rail-highway container stands on its own legs. Above, a container is picked up by a truck which hauls it to a rail terminal.

Le container rail-route Steadman sur pieds. Ci-dessus un container remorqué par un camion vers une gare.

Der Steadman Bahn-LKW-Behälter steht auf eigenen Füssen. Oben: Ein Behälter für den Haus-Haus-Verkehr.

El contáiner Steadman se queda en sus propios pies. Arriba, un camión recoge un contáiner para la terminal ferroviaria.



Container is connected to turntable; hydraulically pushed onto flatcar and swung into position.
Le container est raccordé au pont-tournant, poussé sur wagon plat et hissé en place.
Der Behälter auf der Drehbrücke; eine hydraulische Vorrichtung schiebt ihn auf den Flachwagen.
El contáiner se conecta a la placa giratoria, es trasladado hidráulicamente al vagón.

Nouveau Système Container

Un nouveau système de container rail-route a atteint la phase des essais au Canada. Ce système de la Steadman Industries Ltd., Toronto, comprend trois éléments: containers en multiples de 6.09 m; une poutre balançoire pouvant être monté sur un chassis de camion en quelques minutes et un système de pont-tournant pour wagons plats, deux ou trois ponts-tournant pouvant être montés sur un wagon, selon la longueur du wagon. Les containers sont chargés par le côté pour le transport par rail et une fois en position, sont fixés au chassis du wagon. Une tôle en acier renforce la porte du container. On prétend que ce système revient moins cher que ceux disponibles jusqu'à présent.

Neues Behälter-System

Ein neuartiges Haus-Haus-Verkehrssystem hat in Kanada das Versuchsstadium erreicht. Dieses System, von dem man sagt, dass es weniger kostspielig ist als jedes andere, das bisher auf den Markt gebracht wurde, hat Steadman Industries, Ltd., Toronto, entwickelt; es besteht aus drei Elementen und zwar aus: verschiedenen Behältern von 6.09 m; einem Kippbalken, der in wenigen Minuten auf ein Standard-LKW-Gestell montiert werden kann und aus einer Drehvorrichtung auf Flachwagen. Je nach Länge der Waggons können die Wagen mit zwei oder drei Drehscheiben ausgerüstet werden. Die Behälter werden seitlich verladen und, sobald sie richtig aufgestellt sind, an dem Wagenrahmen befestigt. Die Behältertüren werden mit Stahlplatten verstärkt.

Nuevo sistema contáiner

En el Canadá se hacen ensayos con un nuevo sistema contáiner, el que ha sido elaborado por la Steadman Industries Ltd., Toronto, y consiste de tres elementos: contáineres en 6.09-m múltiples, un "balancín" que se puede montar en el chasis de cualquier camión normal dentro de unos minutos y una placa giratoria para vagones-plataforma. Los vagones pueden ser equipados de dos o tres placas, según la largura. Se cargan los contáineres por los laterales y una vez cargados, se fijan en el bastidor. Se utiliza una chapa de acero para reforzar la puerta del contáiner. Se dice que el sistema es más barato que todos los otros disponibles.

Products of Interest

Crane To Cope With Railroad Work

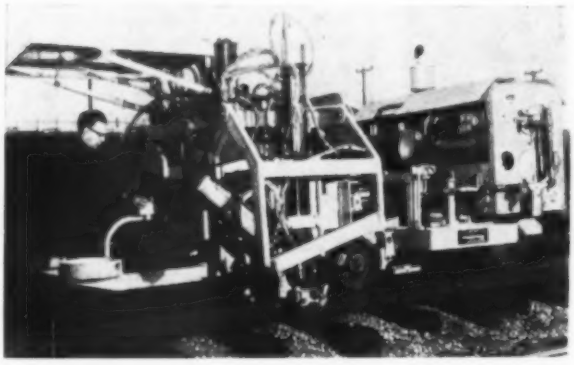
Grue pouvant être manipulée indépendamment ou simultanément.
Ladekran für einen oder mehrere Zwecke gleichzeitig zu bedienen.
Grúa puede operar independiente y simultáneamente.

Designed to meet the demands of railroad work, the 7.5 Ton Capacity Model 30 Burro Crane has individually controlled clutches so that hoisting, swinging, traveling, and boom hoisting can be independently or simultaneously controlled. The tailswing has been designed to allow the Burro to turn completely around without the rear end of the rotating deck fouling the adjoining track. *Cullen-Friedstedt Company, 1300 South Kilbourn Avenue, Chicago 23, Illinois, USA.* **IRJ 1**

Airco Develops New Welding Process

Nouveau procédé de soudage acier-doux Airco, multiples avantages.
Das Airco Weichstahl-Schweissverfahren hat viele Vorteile.
Nuevo procedimiento Airco para soldar acero dulce.

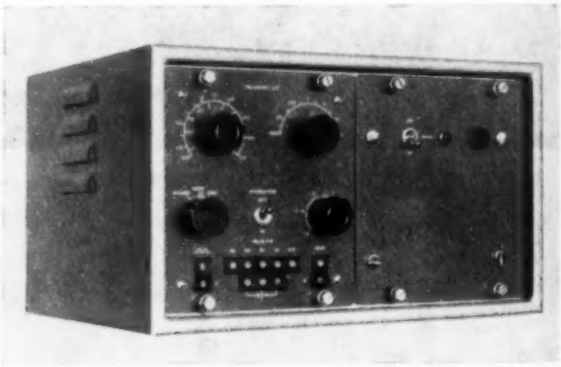
A new process—Aircomatic CO_2 Sprayarc—for welding mild steel combines use of carbon dioxide and a low-alloy steel welding wire. Advantages claimed by the developer include good weld appearance, sound welds, economical deposition rates, continuous wire feed for high work factor and low cost CO_2 shielding gas. *Airco Company International, Division of Air Reduction Company, 150 East 42nd Street, New York 17, New York, USA.* **IRJ 3**



Spike Driving Machine With Auto-Feed

Machine d'entretien de la voie pose automatiquement les crampons.
Schienenwartungsmaschine setzt automatisch Schienennägel.
Máquina para la conservación de la vía — clava automáticamente.

A new railroad track maintenance machine sets spikes automatically for driving, nips up the ties against the rails and drives up to four spikes simultaneously. The Auto-Spiker, which is claimed to eliminate the need for hand setting, is a development of the RMC SpikeMaster. With the new automatic spike feed, the operator has complete control of feeding and setting spikes. *Railway Maintenance Corporation, Box 1888, Pittsburgh 30, Pa., USA.* **IRJ 2**

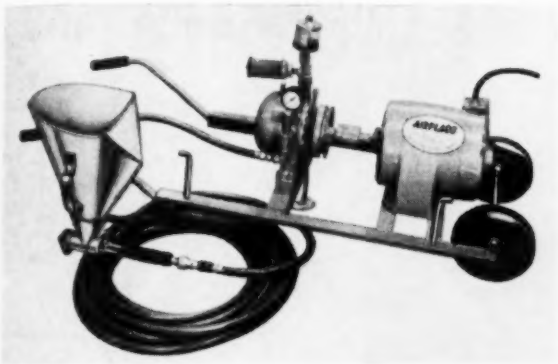


Wave-Form Generator for Servo Testing

Générateur fournit signaux pour essais systèmes servo.
Generator als Signal-Stromquelle für Hilfssystem-Kontrolle.
Generador produce la señal para probar los sistemas servo.

Wave-form generator type TWG100 is a signal source for testing servo systems. Square, sine and ramp wave-forms are available over the range of 0.03 to 30 cps with continuous adjustment within any of six overlapped switched ranges. Sine waves are within two per cent of a true sine. Four fixed outputs of 40, 30, 20 and 10 volts peak-to-peak are available and one variable output 0-5 volts, with accuracies of ± 5%. *Feedback Ltd., Crowborough, Sussex, England.* **IRJ 4**

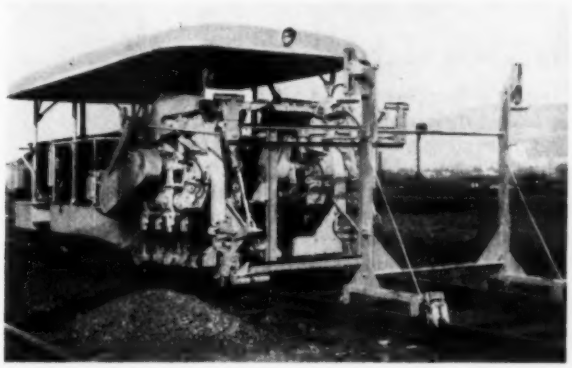
From Railway Suppliers



'Spray-Tex' Applies Paint, Plaster

Nouveau pistolet pour peinture, enduit, couches imperméables.
Neuartige Spritzpistole für Farbe, Verputz und Schutzanstriche.
Nuevo pulverizador para pinturas, yeso, capas impermeables.

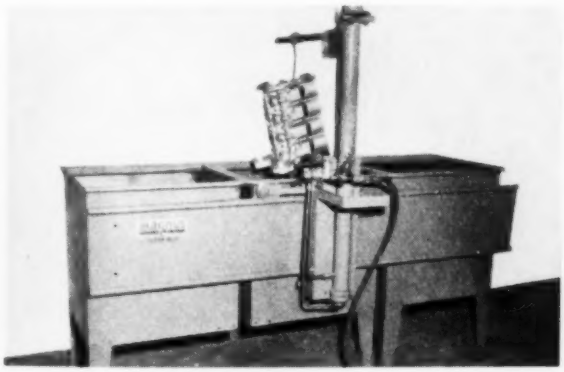
"Spray-Tex" is a lightweight portable slurry and texture gun designed for spraying texture paint, acoustical plaster, waterproofings and finish coats. It is said to be especially useful in painting or repairing masonry structures and basements. Its capacity is about 375 m² per day. It has adjustable feed control and quick-change orifices for texture control. With compressor and motor, it weighs 56.7 kg. *Air Placement Equipment Co., 1000 West 25th St., Kansas City 8, Missouri, USA.* **IRJ 5**



One Machine Lifts, Levels, Tamps

Plasser "VKR-04" combine levage, aplanissement et bourrage.
Plasser "VKR-04" vereint Hub-, Nivellierung-, Gleisstopffunktionen.
Plasser "VKR-04" eleva, nivela y apisona.

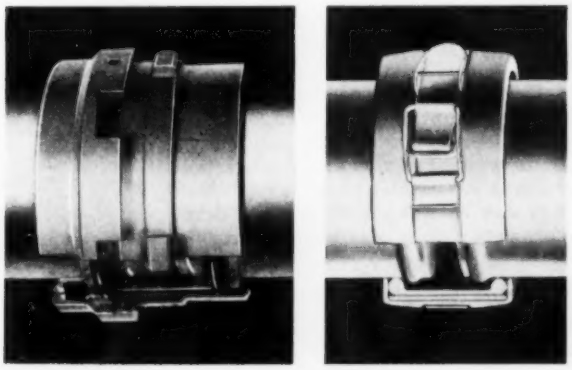
The "Plassermatic Type VKR-04" combines in one machine the functions of lifting, leveling and tamping track. The new machine is, basically, Plasser's previously-approved tamping machine Type VKR-03, improved by addition of jacking and wire leveling units. The VKR-04 needs only four men for lifting, leveling and tamping; works from 350 to 400 meters per hour; and operates in fog or darkness. *Plasser & Theurer, Johannesgasse 3, Vienna I, Austria.* **IRJ 7**



'Tramway' Aids Small-Part Tank-Cleaning

Nouveau tramway accélère nettoyage de petites pièces.
Neue Spülvorrichtung für Feingeräte.
Nuevo aparato para limpiar piezas pequeñas en recipientes.

The "Porto Lif Tramway," applicable to multi-tank operations for cleaning small parts, is a low-cost, 34-kg capacity, lever-controlled, pneumatically operated unit that provides 100 to 140 up-and-down motions per minute in the cleaning solution. The unit illustrated is for two stages—wash and rinse—but the device can be adapted to perform any number of operations. *Magnus Chemical Company, Dept. M-124-1, Garwood, New Jersey, USA.* **IRJ 6**



New Flex Couplings Cover Wide Range

Nouvelle gamme d'attelages flexibles, grande diversité.
Neuartige Kupplungskabel in vielen Grössen und Typen.
Nuevo enganche flexible de diferentes tamaños y tipos.

Three new types of A. C. flexible couplings for fuel, hydraulic, pneumatic, lubrication and corrosive fluid systems are now being manufactured under license in the British Commonwealth. They include a screwed type, a lightweight type (illustrated) and a heavy-duty type. All types are unaffected by vibration or temperature variations. They are available in sizes from $^1/_4$ to 9 in. (0.635 to 22.86 cm). *Aero Controls, Ltd., Weedon Road, Northampton, England.* **IRJ 8**

JACKSON

THE NAME THAT HAS CONSISTENTLY TYPIFIED THE BEST IN TAMPING EQUIPMENT FOR MORE THAN 40 YEARS

Let us help you to the best solution of your tamping problems.

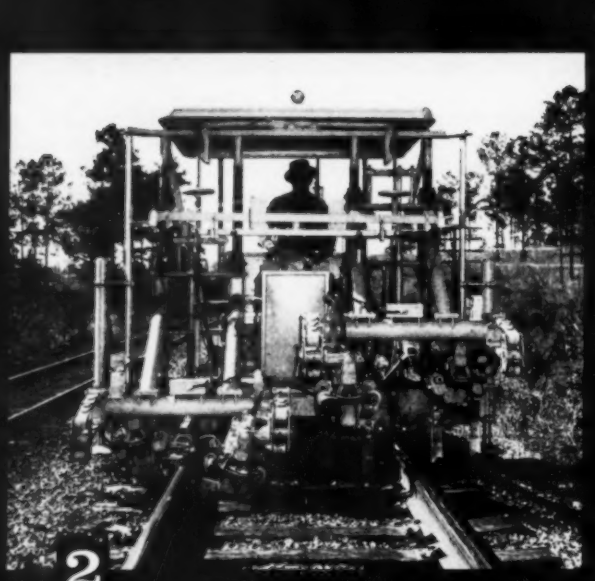
1 JACKSON TRACK MAINTAINER

For both putting up and maintaining track of finest, longest-lasting quality at minimum cost, this is the finest tamping machine money will buy. Powerful vibratory action and complete push-button control make it exceedingly fast. It's overwhelmingly first choice of U.S.A. railways. Available in U.S.A. standard and wider gauges.

1

2 JACKSON UNIVERSAL

An excellent production tamper which rapidly produces complete consolidation of ballasts up to 3" in diameter in proportionate out-of-face raises. Highly efficient in tamping hanging ties or sleepers. Entirely push-button operated. Jacks and automatic spacer for double joint ties optional. Available in all standard gauges from meter to widest.


2

3 JACKSON MONORAIL

A complete tamping machine ideal for spotting and smoothing, secondary programs and all yard track maintenance. Utilizes powerful "Maintainer" tamping units. Traveling, indexing and workhead are all hydraulically controlled. All standard gauges.

3

4 JACKSON HAND TAMPERS

Vibratory-electric . . . operated from portable power plant serving 4 tampers. Universally used in low lift and smoothing work as well as major ballast insertion operations. Adjustable handles and interchangeable tamping blades make them quickly adaptable to all workers and tamping requirements.

4

Write, wire or cable for complete information

JACKSON VIBRATORS, INC.

LUDINGTON, MICHIGAN U.S.A.

(Advertisement)

1. MACHINE JACKSON POUR L'ENTRETIEN DES VOIES

Action vibrante à grande capacité. Service complet par appui sur bouton. Meilleur pour la pose et l'entretien des voies. Système le plus demandé par les chemins de fer américains. Livrable pour tous les écartements de voie standard E.U.A. et autres.

2. JACKSON UNIVERSAL

Une bourreuse à production excellente, donnant une consolidation rapide au ballast. Très efficace pour fixer les traverses. Vérins et régulateurs automatiques de traverses à double joints au choix. Service par appui sur bouton. Livrable pour tous les écartements de voie d'un mètre et plus.

3. JACKSON MONORAIL

Machine à bourrer complète, à fonctionnement hydraulique. Excellente également pour marquer, égaliser et entretenir les voies. Tous les écartements normaux.

4. BOURREUSE À MAIN JACKSON

A vibrations électriques, opéré d'une centrale électrique portable desservant quatre bourreuses. Manettes et aubes réglables pour buts divers.

1. JACKSON GLEISUNTERHALTER

Leistungsfähige vibrierende Tätigkeit. Vollständige Druckknopfbedienung. Die beste Maschine zum Anlegen und Unterhalten der Gleise. Wird von allen amerikanischen Eisenbahnen bevorzugt. Lieferbar für alle Spurweiten.

2. JACKSON UNIVERSAL

Besonders zweckmässig zum Feststopfen der Bettung. Hebewinde und automatischer Regler von Schwellen mit doppelten Stopfflächen. Druckknopfbedienung. Lieferbar für alle Spurweiten.

3. JACKSON MONORAIL

Eine vollständige hydraulische Gleisstopfmaschine. Auch besonders geeignet zum Markieren, Ebnen und Unterhalten der Gleise. Alle normale Spurweiten.

4. JACKSON HANDGLEISSTOPFMASCHINE

Elektrisch vibrierend, wird von tragbarer Kraftzentrale geleitet, die vier Gleisstopfmaschinen bedient. Umstellbare Hebel und Schaufeln für verschiedene Zwecke.

1. MANTENEDORA DE VIAS JACKSON

Intensa acción vibratoria. Sistema completo de botones para los mandos. La mejor máquina para la instalación y el mantenimiento de las vías, preferida por la inmensa mayoría de los ferrocarriles norteamericanos. Puede obtenerse en anchos de 143.5 cm o mayores.

2. JACKSON UNIVERSAL

De extraoridinaria eficiencia para el apisonado en general y de traviesas salientes. El equipo opcional incluye gatos y espaciador automático de doble traviesa. Accionada por botones. Para anchos de vía de un metro o mayores.

3. MONORRIEL JACKSON

Máquina apisonadora de funcionamiento totalmente hidráulico . . . Ideal también para nivelaciones, rasanteado y mantenimiento de las vías de patios. Para todos los anchos de vía standard.

4. APISONADORAS DE MANO JACKSON

Del tipo vibratorio-eléctrico, accionadas por una planta portátil que alimenta cuatro apisonadoras. El mango y las hojas se pueden ajustar para distintas aplicaciones.

JACKSON VIBRATORS Inc.

World Market CONTINUED

▶ *Columbian National Railways*—Have ordered 15 main-line diesel-electric locomotives, to cost $2.6 million (US), from the General Electric Company. Six of the new locomotives are rated at 1,420 hp; eight at 900, and one at 700. All are of the universal type and are suitable for passenger, freight and switching service. Colombia's 100-km Atlantic Railway, due for completion in the near future, is expected to be the service area of the new locomotives, which will be equipped with dynamic brakes for operation over the mountain grades. All 15 locomotives will be operable on multiple-unit combinations with each other or with any of the 31 other General Electric locomotives already in service in Colombia. Shipment of the new locomotives is scheduled for June and July.

▶ *United Arab Republic*—A new bridge across the Suez Canal, to replace an existing one at El Ferdan, has been authorized by the Egyptian Railway Board. Cost of the project is estimated at 1,500,000 Egyptian pounds.

▶ *Uruguay*—Thirty firms have submitted bids for supplying 39 diesel-electric locomotives to the railway system. Final award of contracts is not expected for about 50 days.

▶ *Yugoslav National Railways*—Has secured a $5,200,000 loan from the Development Loan Fund. The money will assist purchase in the United States of 21 diesel locomotives.

▶ *Britain*—Railway signaling equipment produced by L. M. Ericsson of Sweden is to be sold and manufactured in Britain. An agreement has been signed between Ericsson's and M. L. Holdings, through their substantial subsidiary, M. L. Engineering (Plymouth) Ltd.

The North East Region of the British Railways has placed a contract with the Westinghouse Brake and Signal Co. Ltd. for the provision and installation of color-light signaling operated by CTC over the 50.6 km between York and Beverley on the York–Hull line.

▶ *Ceylon Government Railways*—Bids are being sought for supply and delivery of 17,250 long tons of steel rails and fastenings. Included are 6,425 long tons of 3.5 kg flat-bottom rail and 10,825 long tons of steel fastenings consisting of fishplates, fishbolts, bearing plates and spikes. All must comply with requirements of British Standard Specifications No. 11.1959. Bids must reach the Chairman, Tender Board, Ministry of Transport and Works, P.O. Box 547, Colombo, Ceylon, on or before 26 July.

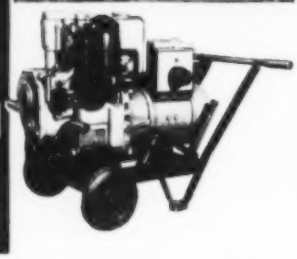
CONTINUED ON PAGE 54

Track Ballast efficiently consolidated with KANGO

ELECTRIC BALLAST TAMPERS

The Kango Electric Ballast Tamper carries out the important duty of consolidating track ballast on plain line, points and crossings. It is a light, balanced machine easy to operate and the special tamping tools are designed for ease of entry when used on crossings. These machines will quickly consolidate ballast and this work can be carried out without interfering with normal traffic. Kango Ballast Tampers are ideally suitable for operation off the Kango 3 kw. Diesel Generator.

THE NEW KANGO GENERATOR the lightest 3 kw. diesel powered generator in standard production



The new 3,000-watt Kango Portable Diesel Generator is so light it can be wheeled with ease. It takes only two men to carry it and weighs only 250 lbs. (111.5 kgs). This specially designed lightweight generator is powered by a HATZ E.75 lightweight 4-stroke high speed diesel. The generator can be supplied for either 110 volts or 240 volts DC or 50 cycles AC and powers four Kango Ballast Tampers at one time.

Full Ballast Tamper and Generator details can be obtained from:

KANGO ELECTRIC HAMMERS LTD

LOMBARD ROAD · MORDEN ROAD · SOUTH WIMBLEDON · LONDON · ENGLAND

World Market CONTINUED

▶ *State Railway of Thailand*—A loan equivalent to $22,000,000 (US) has been obtained from the World Bank to assist in a six-year rail modernization program. The Railway will purchase about 65 main-line and shunting diesel locomotives, an estimated 1,650 freight cars, and will replace about 579 km of track with heavier rail. Also included in the program are plans to remodel station yards and construct or extend siding tracks, replace about 350 wooden bridges with steel or concrete, install signaling and telecommunications equipment at 100 stations, and purchase machinery and equipment for repair shops. Present loan funds will be used to acquire the locomotives and freight cars, with the remainder allocated to replacement of bridges.

▶ *Manila Railroad Company (Philippines)*—Plans to put up a Luzon-wide radio tele-communications network. The project will be undertaken shortly as part of a modernization program.

▶ *Queensland Railways (Australia)*—Two new contracts, worth over £2,500,000, for construction work in connection with the Mount Isa Rehabilitation project, have been let to an international group of contractors. Hawaiian Dredging and Construction Co. International, of Honolulu; J. H. Pomeroy and Co. Inc., of San Francisco; and S. Haunstrup and Co. Pty., Ltd., of Melbourne, Victoria.

▶ *South African Railways*—Bids are invited by the SAR for goods vehicles, mechanical horses, differential carriers and a sawdust extracting plant.

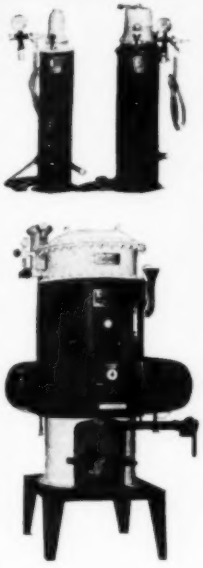
▶ *Kowloon-Cantoon Railway*—The government has announced plans for modernizing the 35.4-km line to the Communist China border. Projected modernization includes replacement of old mechanical signal system at Kowloon with up-to-date centralized signaling system. This involves replacing existing signals at an estimated cost of $580,000.

▶ *Norway*—Bids will be received by the Tunnelbanekontoret, Mailundveien 21, Oslo, for supply, delivery and erection of nine complete rectifier units for a new subway.

▶ *Greek State Railways*—Has obtained bids for coal and coke supplies to cost approximately $700,000 (US). Included are 46,000 metric tons of steam coal and 80 metric tons of foundry metallurgical coke. Deliveries will begin 1 August.

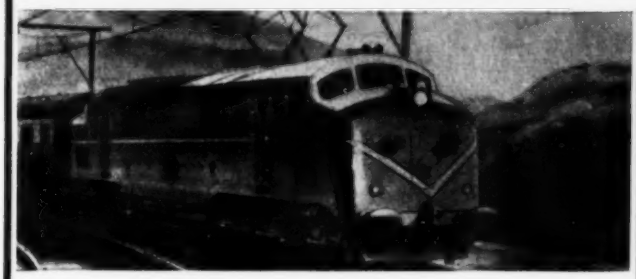
▶ *Morocco*—The government plans to spend 10 billion Moroccan francs on the country's railway network under its first five-year plan.

STREAM-LINE FILTERS



EDGE-TYPE FILTERS

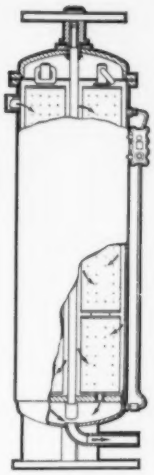
Illustrated above is a selection from the standard range of pressure operated edge-type filters.



for the purification of engine lubricating oil

A complete range of Stream-Line *by-pass* filters is now available for the filtration of lubricating oil supplied to large stationary diesel engines, locos, marine engines etc. The edge-type filter for straight mineral oil uses the well-known Stream-Line principle of special paper discs spring-compressed on rods to remove the ultra-fine peptised carbonaceous matter which tends to impair the efficiency of a *full-flow* filter; the new Micro-Pak, for detergent oil, has an element comprising low cost, expendable cartridges of lintless, acid-resistant, cellulose material. This gives the best efficiency that can be associated with a sustained, adequate flow rate, together with high capacity for retained solids and, therefore, long cartridge life.

Please write for full details of how these economical, easily serviced filters can help extend the life of your lubricating oil—and your engine and its full flow filter.



MICRO-PAK FILTER

The Micro-Pak is available in a range of capacities with centre-bolt or multi-bolt head, and in either heated or unheated versions.

STREAM-LINE FILTERS LIMITED

HENLEY PARK · NORMANDY · NR. GUILDFORD · SURREY

STREAM-LINE

Telephone: Normandy (Surrey) 3311-3 Telegrams: Edgefilt, Guildford

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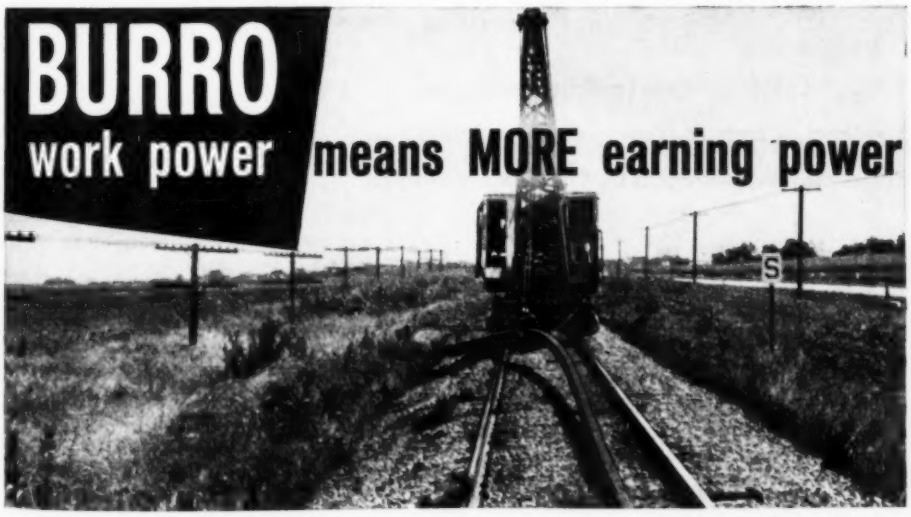
S.F.III

BURRO

work power means MORE earning power



Burro Crane, with threader suspended from boom of the crane to guide the rail, shifting new welded rail from the shoulder to the center of track.

Model 40 Burro Locomotive Crane Ditcher with long digging radius to permit starting ditch ample distance from track. This Model 40 Burro not only digs ditch and loads both near and far ends of cars, but also hauls its own cars with its own power.

On the line, in the yards, or Stores Department – a Burro does the job fast, efficiently, and profitably. Fast travel speeds and heavy draw bar pull enable the Burro to go to the job in a hurry – and even haul its own cars with it. Once on the job, the Burro wastes no time getting the job done with hook, magnet, tongs, bucket or dragline.

CULLEN - FRIESTEDT CO.,

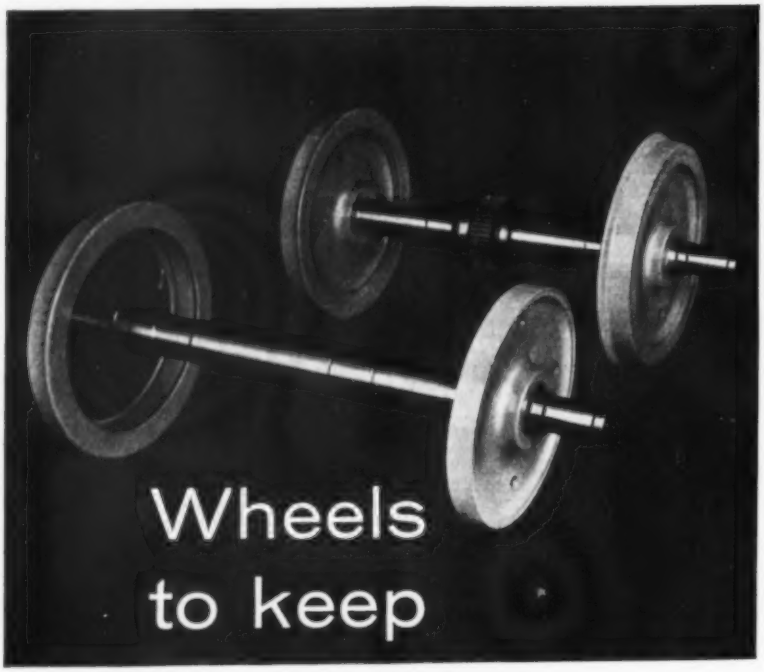
1314 S. KILBOURN AVE. · CHICAGO 23, ILL., U.S.A.

Represented in Canada by:

SYLVESTER STEEL PRODUCTS CO., LTD.

LINDSAY, ONTARIO

Write for Bulletins and more information about Burro Cranes



the diesel railcars rolling

Wheels, tyres, and axles for diesel railcars are manufactured by Steel, Peech & Tozer, and machined and assembled into complete sets by Owen & Dyson Limited.

With nearly seventy years' experience, Steel, Peech & Tozer is well-equipped to supply the railways of the world with special quality steels to meet all modern conditions.

steel, peech & tozer

THE ICKLES · ROTHERHAM · YORKSHIRE

A branch of The United Steel Companies Limited

THE UNITED STEEL COMPANIES LTD

SP231

Transmission for Light Diesel Locomotives

A form of transmission employing a fluid coupling for use on light diesel locomotives has been developed by Motor Rail Ltd., of Bedford (England). The development of the transmission arose from the needs of the South African Mining industry which uses light diesels on the surface and underground.

The Simtran transmission designed by Motor Rail employs a fluid coupling (both dry fluid and oil types are available) combined with a constant mesh gearbox containing two hydraulically operated multi-plate clutches for change of direction and change of speed. Change in speed is accomplished by synchromesh clutches and the change speed lever automatically operates the multi-plate clutch. The fluid couplings at slow engine speed are resilient, absorb engine unevenness and have smooth engagement until working speed. They also are highly efficient and have a low heat discharge when used underground in mines.

The coupling operates as a normal mechanical clutch in accepting over-run from the train on a down grade. In the case of the dry fluid coupling, it is impossible—when engine and locomotive are stationary—to start the engine by pushing the locomotive. This eliminates hydraulicing. With the oil fluid coupling, hydraulicing is also eliminated. Another factor in the coupling's favor is that it facilitates "inching" for accurate spotting of cars for loading or unloading.

The transmission uses the same type of oil as the diesel engine, which means that separate grades of oil do not have to be stored underground.

For existing users of light diesel locomotives with conventional gearboxes and manual clutches, Motor Rail offers Simtran conversion kits.

Corrections

On page 6 of the April issue reference was made to Davis & Lloyd bogie components being built by Scaw Metals Ltd. "under arrangement with General Steel Castings Co., USA." While Scaw Metals do have an arrangement with General Steel Castings Company for manufacture of "Commonwealth" type Bogies, "Davis & Lloyd" bogie components are made by them under an arrangement with their principals, English Steel Castings Corporation, Ltd., Sheffield and not General Steel.

IRJ also regrets that on page 20 of the May issue, the Railway Maintenance Corp. (US) was incorrectly listed as the Railway Machinery Corp.

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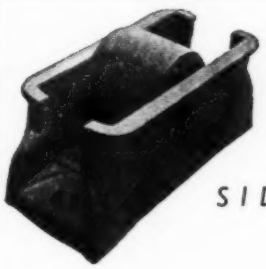

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After Hours with

Jim Lyne

"MARGINAL COSTS"—There does not seem to be much agreement, either internationally or intranationally, on just where the "floor" should be fixed for railway rates. Should it be at "marginal costs" and, if so, should such costs be computed on a long-run or short-run basis? Every country is confronted with the problem of channeling traffic in the most economic channels—yielding the most transportation service for the least expenditure. The skilfull and intelligent setting of comparative rates for the several forms of transport seems to be a rather pressing requirement. Do any railwaymen believe they have solved it—and, if so, how?

DOCUMENTATION—The Pan-American Railway Congress Association (Calle Peru No. 277, Buenos Aires) is doing quite a job of listing periodical railway literature in its bi-monthly "Boletin"—the actual compilations being done by Ing. J. Nuñez Brian, executive secretary of the Permanent Commission of the PARCA. In the "Boletin," also, Ing. Nuñez Brian lists railway terminology of the various Latin-American countries. In a recent issue was published a word list from Costa Rica which included, for example, "jaibol" as a "signal for departure"—this, quite evidently, being the Spanish spelling of the US term "highball," which is the term for the "let's go" signal.

INTERNATIONAL VISITING—I have a letter from a US railway signalman, recently returned from a two weeks' visit to Britain, where he spent most of his time looking over the British railways—and reports that he was pleased and just a little surprised at "the efficiency and smoothness of operation" that he encountered. There has been quite a little international visiting by railwaymen in the higher echelons of management—but there is no reason why "seeing how the other fellow does it" should be restricted to officers at the top. There are always some things at which each railway system excels, and there is no better way (when occasion permits) of adapting these excellencies to one's own work, than actually seeing them in operation.

STATION NAMES—Alan Jones of Leeds in Yorkshire (England) has sent me a British Railways booklet advertising train services to holiday areas in North Wales, one of the local stations of which has the formidable name of:

LLANFAIRPWLLGWYNGYLLGOGERYCH-WYRNDOBWLLLLANTYSILIOGOGOGOCH

The name is contracted in the folder to Llanfair P. G. Mr. Jones says it's pronounced "Thlanfair" — which is a lot closer to the spelling than some other English place names I've heard of.

Railway Bookshelf

De Stoomlokomotieven der Nederlandse Tramwegen, by Eng. S. Overbosch (H. Stam, Haarlem)—The "Moordenaars" (murderers), as the steam trams of Holland were known with a certain amount of macabre affection, were a Dutch institution for over half a century. Now a Dutch engineer with an obvious love for the little lines and a fascination with the steam locomotive has produced one of those rare and delightful works, a detailed and scholarly monograph that could only be written by a confirmed enthusiast. With a genealogist's care Eng. Overbosch has chronicled every steam tram engine that ever operated in Holland—over 200, all told—with individual histories, specifications, usually photographs and often detailed drawings. The list is a fascinating one—from small machines that might have been more at home roasting peanuts up to the only Garratt ever operated in The Netherlands (and probably the only inside-cylinder Garratt ever built). Enthusiasts, and students of the unusual in steam-locomotive design, will find the Dutch language no barrier.

Le Nostre Locomotive Elettriche by Michel Dard (Quaderni delle Ferrovie Italiane dello Stato no. 9, Centro Belazioni Aziendali, FS Italia, Roma; 96 pp, Lire 350)—Though somewhat limited in carrying the story only to 1957, this attractive booklet is an excellent history of the electric locomotive development of the FS from the first battery-operated line in 1899 to the modernization-program years. In the process Dard provides a brief and fascinating history of electrification in Italy. (Italian).

Storia del Mostro (Le Nostre Locomotive a Vapore) by Manlio Diegoli (Quaderni delle Ferrovie dello Stato no. 10; same as above)—While we cheer progress, the passing of the steam locomotive leaves a little sadness with most of us. Steam and railways have been virtually identical in the public imagination for too many years, and even in the age of diesels and electric traction our children, when they "play trains," imitate the sounds of steam. This volume is a double bargain. The author has given a history—in pictures and words—of a notable family of steam locomotives from "Bayard" of 1839 to the massive and utilitarian American-Built "GI" 2-8-0's of the immediate postwar period. They are all here, and it is hoped that some at least of these locomotives, still to be found on FS property, will find a permanent museum home. In presenting the steam locomotive the booklet's designers have taken the opportunity to present first-rate railway art in full color: 12 paintings of French and Italian origin ranging from early 19th century to the 1950's. The almost-photographic realism and draftsmanship of so many railway paintings is missing here. The last color plate in the book gives an unwitting clue to the graphic excellence of FS publications in general: the watercolor "Il Mostro" (The Monster"), with its brilliant abstract use of color and its powerfully effective fantasy, is the work of Nicolo Coppola of the FS public-relations staff, and was in fact a study for the cover of the 1957 FS annual report. Whether for the steam locomotive or for art—ideally for both—*Storia del Mostro* belongs on every railway bookshelf. (Italian).

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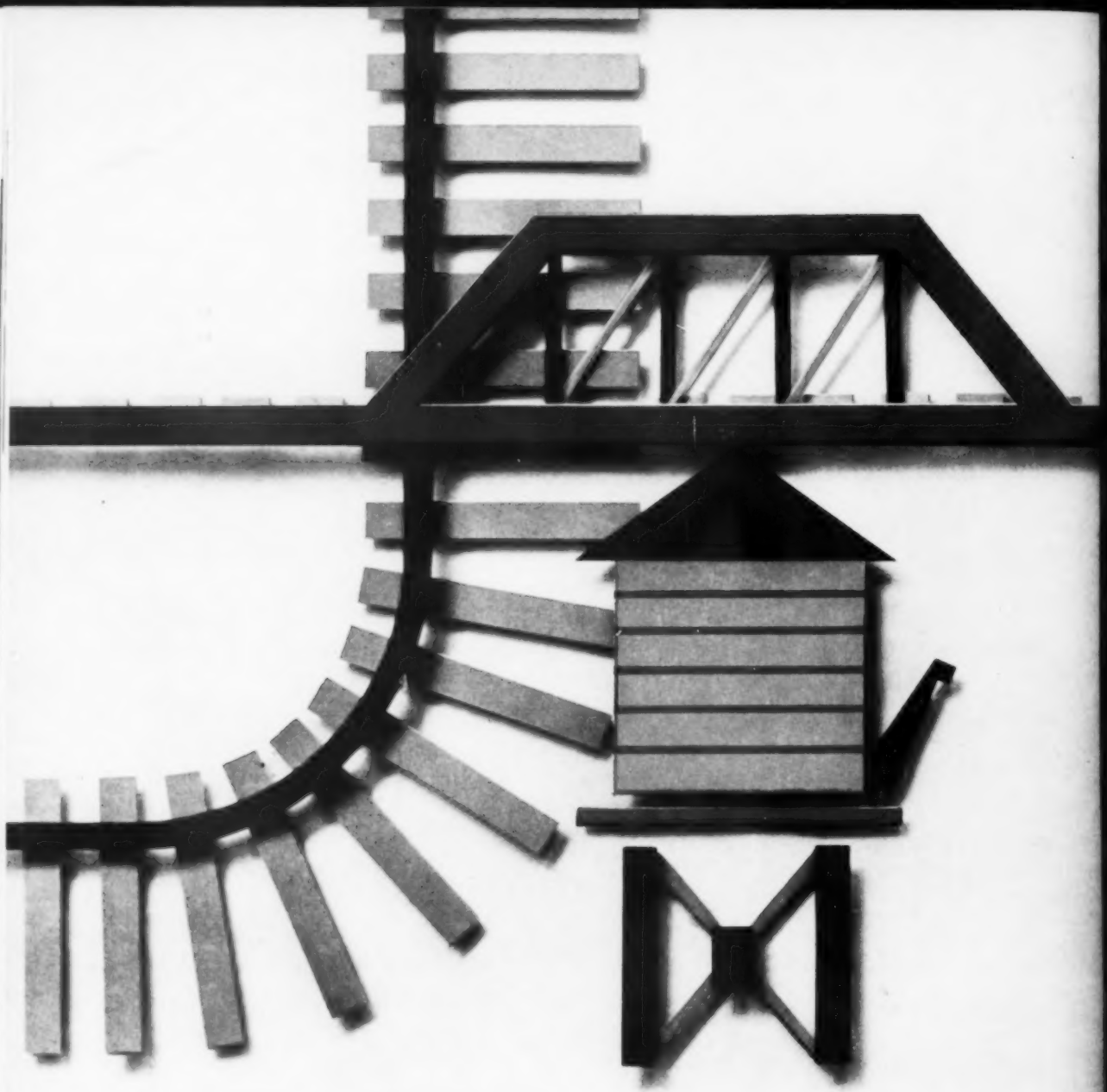

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